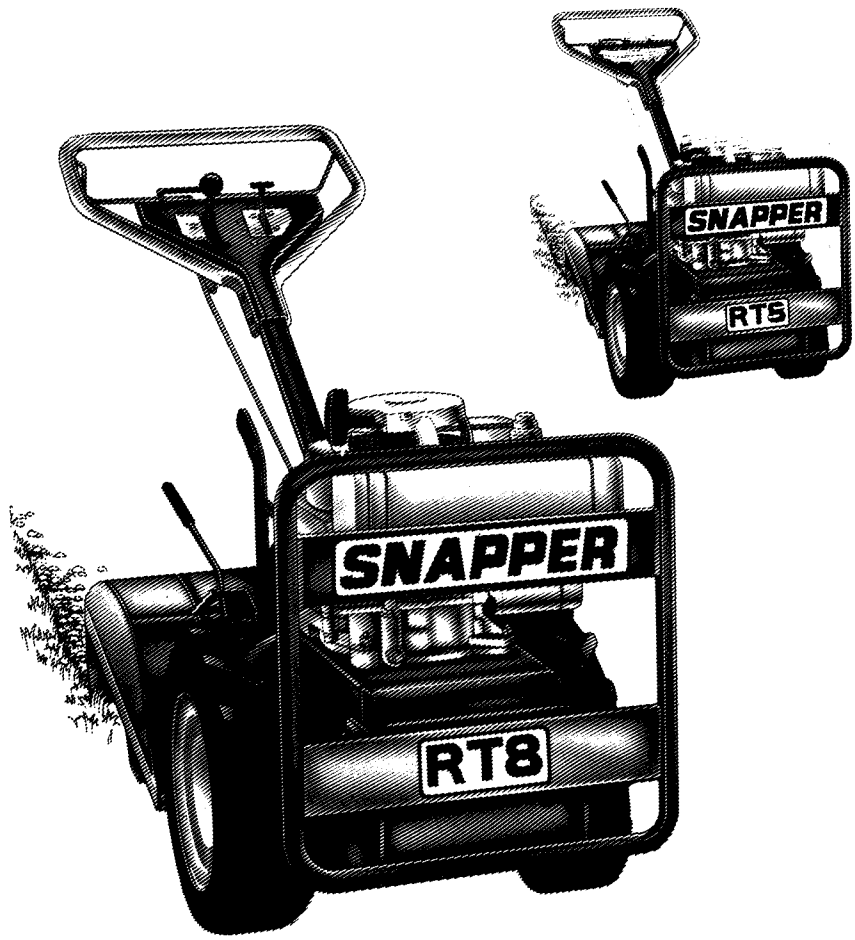
Service Manual for

SNAPPER®

RT5 & RT8 SERIES



REAR TINE TILLERS

SNAPPER POWER EQUIPMENT
McDonough, GA • 30253

A FUQUA INDUSTRIES Company

MANUAL #07023

SECTION 1: OPERATIONAL PROCEDURES

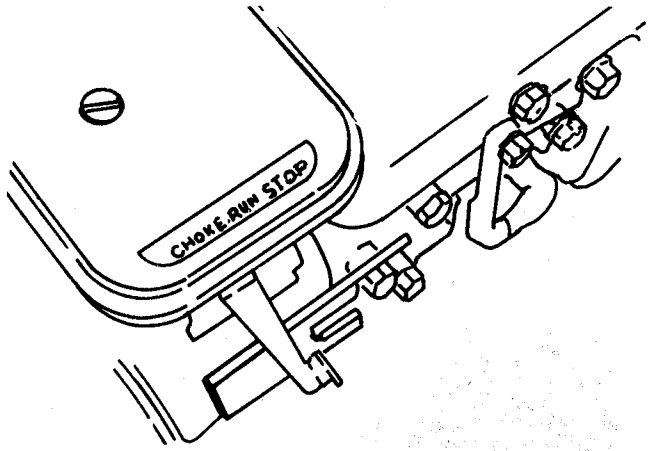


FIG. 1. 1 - RT5 START-STOP CONTROL

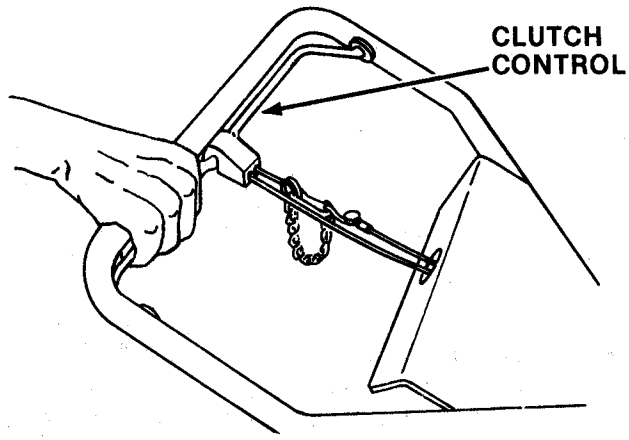


FIG. 1. 3 - RT5 CLUTCH CONTROL

INTRODUCTION - SECTION 1.

This first section covers some general operating procedures for the RT5 and RT8 series tillers. This information is from the Operator's Manuals furnished with new units. Refer to the Operator's Manuals for complete details.

PRE-START CHECK LIST

CHECK ENGINE OIL and bring level up to full (refer to engine manual for oil specifications).

CHECK AIR CLEANER and service according to instructions in Engine Manual.

CHECK EXTERNAL SURFACES and remove dirt, dust accumulation and clean tines as needed.

CHECK GUARDS to make sure all are in proper position and securely tightened.

FILL FUEL TANK where fumes will be safely dissipated. Refer to engine manual for fuel specifications.

STARTING-STOPPING

The driving wheels and tines with TINE CONTROL engaged (figure view B) are engaged by moving the CLUTCH CONTROL up to the handle bar. Before atempting to start the engine, check to make sure the CLUTCH CONTROL is in disengaged position away from the handle bar. The engine starting-stopping control is locate on the front left side of the engine. Operate engine as follows:

STEP 1: On cold start, move the engine control all the way forward to CHOKE position.

STEP 2: Pull rope starter out in smooth steady motion until engine runs. Guide rope starter handle back to engine rather than allowing it to snap back.

STEP 3: Allow brief warm up period then move engine control rearward out of full forward (choke) position to desired speed setting.

STEP 4: To stop engine, move engine control rearward to STOP position.

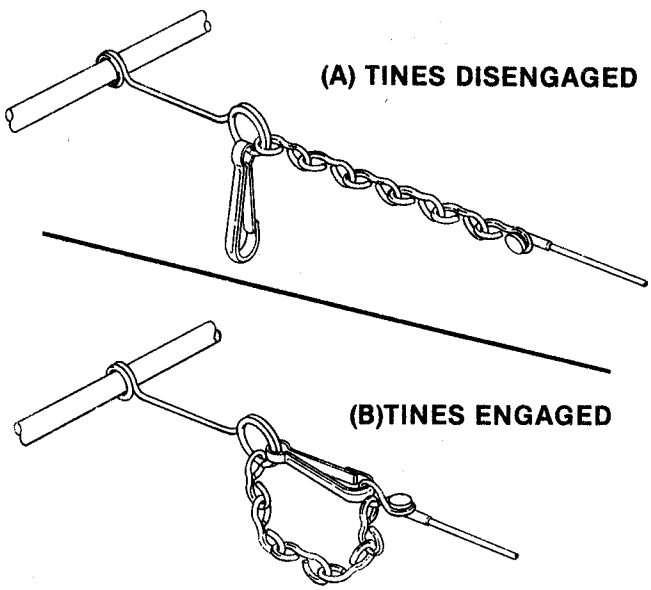


FIG. 1. 2 - RT5 TINE CONTROL

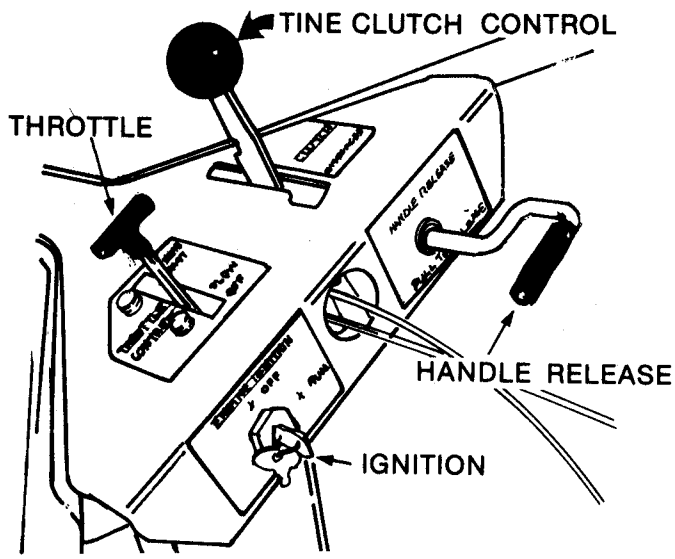


FIG. 1. 4 - RT8 CONTROL PANEL

STARTING-STOPPING

Know beforehand how to stop the tines, wheel drive and engine in preparation for possible emergencies. The engine is stopped by either moving the ENGINE IGNITION keyswitch to OFF or by pulling the engine THROTTLE CONTROL rearward to OFF. Tine rotation is stopped by either shifting the TINE CLUTCH control to disengaged position or by releasing the CLUTCH CONTROL which stops both the drive wheels and tine rotation even with the TINE CLUTCH in engaged position. Operate engine as follows:

STEP 1: Shift the transmission into #1 speed position, move the TINE CLUTCH into disengaged position and make sure CLUTCH CONTROL is in released position.

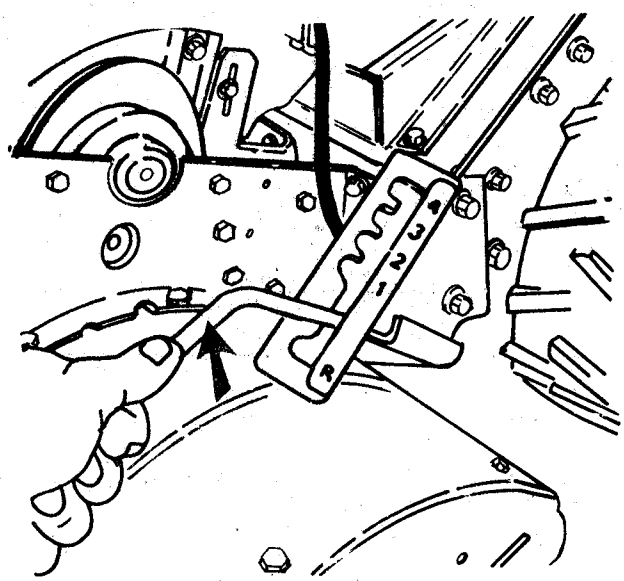


FIG. 1. 5 - TRANSMISSION SHIFT (ALL)

STEP 2: Insert the key and turn the ENGINE IGNITION switch to RUN POSITION.

STEP 3: On cold starts, move the engine THROTTLE CONTROL forward into CHOKE position.

STEP 4: Move around to right side of unit and pull ROPE STARTER on engine in smooth steady motion until engine starts. To prolong the life of the rope, quide the starter handle back to the engine rather than allowing it to snap back.

STEP 5: Allow brief engine warm-up period then move the engine THROTTLE CONTROL rearward to the desired FAST or SLOW speed setting. Refer to TILLING PROCEDURE section on next page.

STEP 6: To stop the engine, move the ENGINE IGNITION switch to OFF or pull the engine THROTTLE CONTROL rearward to OFF.

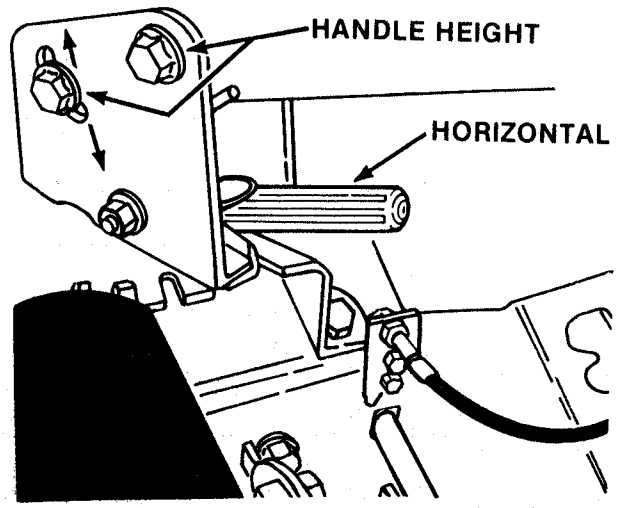


FIG. 1. 6 - RT5 HANDLE ADJUSTMENTS

HANDLE BAR ADJUSTMENT

Horizontal positioning of the handle bar is changed from center position to two horizontal positions on either side as follows: Raise the horizontal position lever and swing the handle bar to desired position, align notch and release the lever. Refer to figure 6.

The handle bar is also adjustable vertically for your comfort. This adjustment requires a 9/16" box or open end wrench. To adjust vertical height, loosen the two lower bolts on the handle pivot bracket, reposition the bar to the desired height then securely tighten the two bolts. Refer to figure 6.

HANDLE BAR ADJUSTMENT

The handle bar can be moved horizontially from the center position to two positions on each side by pulling the HANDLE RELEASE control rearward and swinging the handle bar to the desired position. Push the HANDLE RELEASE toward the panel to lock in position. The handle bar can be raised or lowered by loosening the bolts with a 9/16" wrench as shown in figure 6. Securely tighten the bolts after adjusting

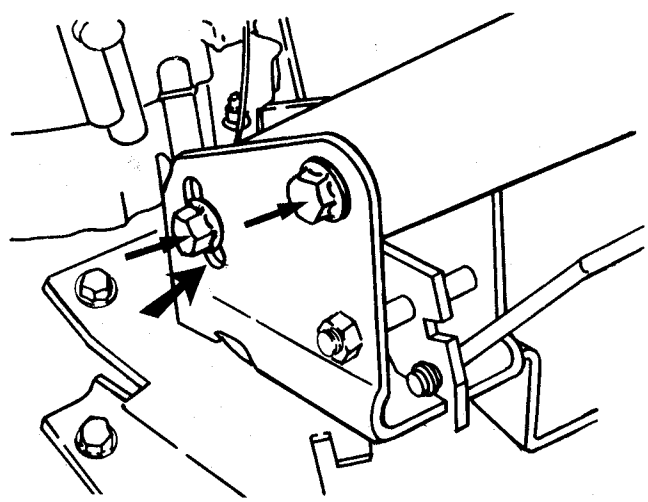


FIG. 1. 7 - RT8 HANDLE HEIGHT ADJ.

TINE ROTATION SELECTION

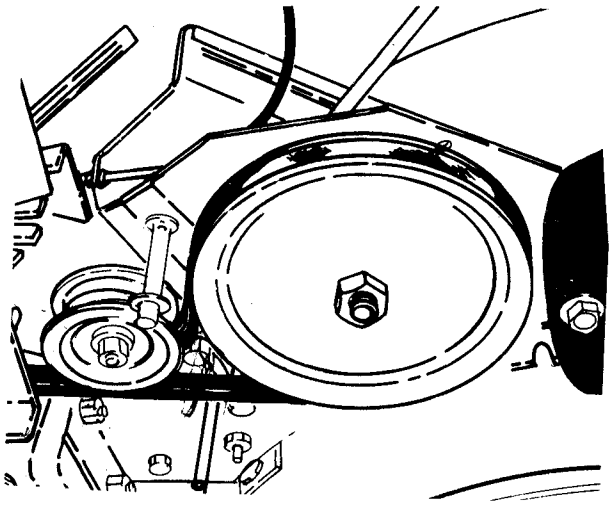
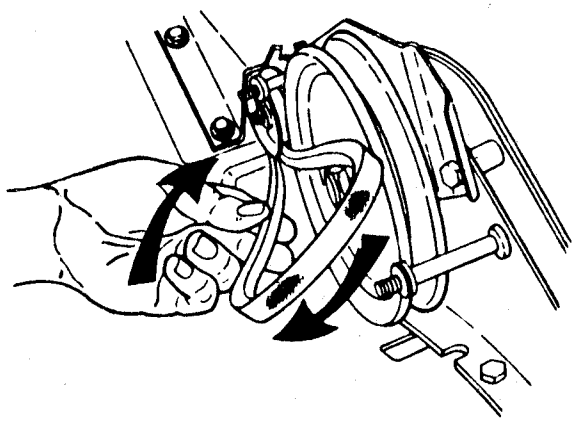


FIG. 1. 8 - TINE BELT DRIVE-PULLEY

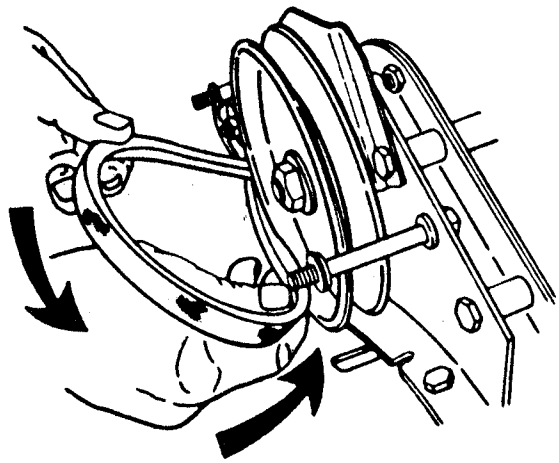
CHANGE TINE ROTATION with engine off as follows: Remove the wing-nut and washer on the front stud of the belt cover, pull the cover outward over this stud then swing the cover rearward and out of the way over the belt pulley. With the clutch control released, there is sufficient slack to slip the belt off the pulley for changing the arrangement as shown in figure 8.

TO CHANGE FROM REVERSE TO FORWARD: TAKE BELT OFF BOTTOM OF BIG PULLEY. PULL TOWARD YOU AND HOLD IN LEFT HAND. REMOVE BELT FROM TOP AND PULL DOWN. PLACE BELT (HELD BY LEFT HAND) UNDER LITTLE PULLEY AND OVER BIG PLULLEY.



TO FORWARD (A)

FIG. 1. 9 - REVERSE TO FORWARD (A)



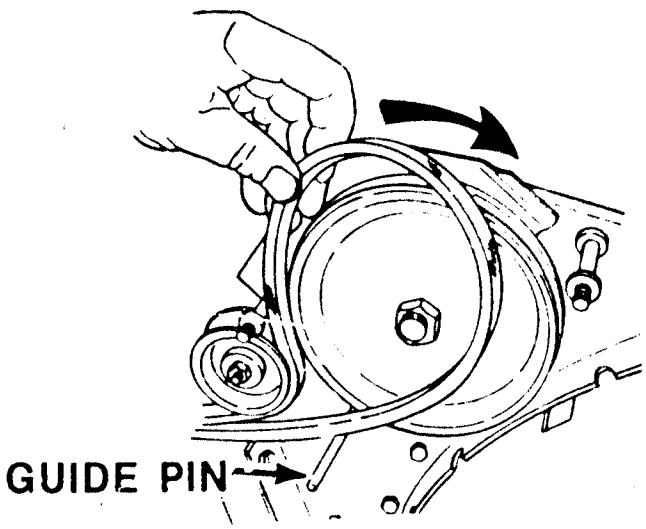
TO REVERSE

FIG. 1. 10 - FORWARD TO REVERSE

When in forward mode for cultivating between rows, the tines do not have to be switched from side to side, however, the Tiller will thus break previously tilled soil to a depth of only 1 or 2 inches. To dig untilled soil or to till deeper for seed bed preparation, switch the tines from right to left side.

TO CHANGE FROM FORWARD TO REVERSE: TAKE BELT OFF TOP OF BIG PULLEY, PULL TOWARD YOU AND HOLD. LIFT BELT FROM BOTTOM AND PUT IN TOP OF PULLEY.

- MAKE SURE BELT IS RUNNING TRUE UNDER LITTLE PULLEY, AROUND BIG PULLEY, AND ABOVE GUIDE PIN.
- SWING BELT COVER FORWARD & INSTALL WINGNUT.



TO FORWARD (B)

FIG. 1. 9 - REVERSE TO FORWARD (B)

SERVICE NOTE: Since a tiller normally operates under extremely dusty or dirty conditions, the air cleaner, engine oil and cooling fins must be serviced as specified in the engine manual at frequent intervals. The Tiller itself should be serviced as follows:

STANDING TILLER ON END

Many of the services described in the following specify standing the tiller on end for easy access to components on the underside of the frame. The Tiller may also be stored during the off-season on the front stand-up bar. If the fuel tank is less than half full the fuel should not leak out of the filler cap. Take necessary steps to prevent fuel leakage before standing on end. If the tiller is stored on end for any length of time, check for oil leakage. CAUTION: Never stand the tiller on end with the engine running! Stop the engine and disconnect the spark plug wire to prevent accidental starting before standing on end.

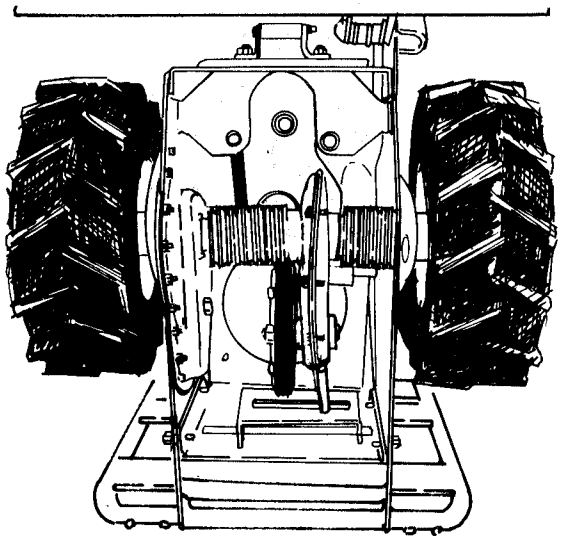


FIG. 1. 11 - TILLER ON STAND-UP BAR

LUBRICATION-TILLER

CHAIN CASE: Check the level of the oil in the chain case each time the engine oil is changed. Check by removing the check plug and washer located just above the tine shaft. The level should be up to the edge of the opening. To add oil, remove the plastic plug on upper side of case, add Snapper OO grease as needed to bring level up to bottom edge of the check plug opening. The total capacity of the case is about 1 U.S. standard quart -- do not exceed this amount. Reinstall plugs and washer after checking.

REDUCTION GEAR CASE: This unit is pre-lubricated with Snapper 00 grease and will not normally require additional lubrication.

MOVING POINTS: Grease shift lever, roller and cam on traction clutch yoke and other moving surfaces twice a year.

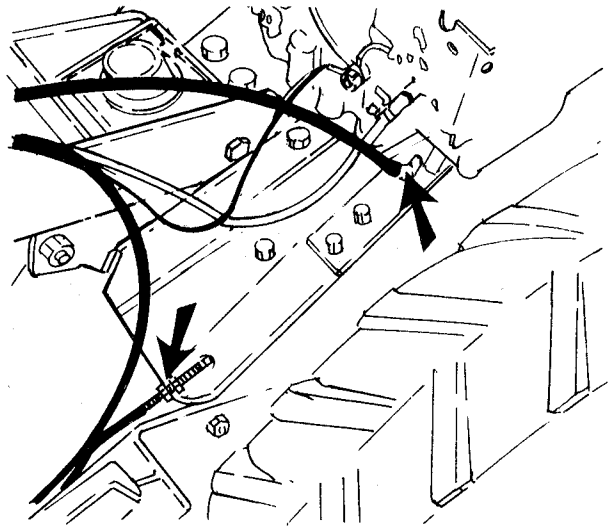


FIG. 1. 12 - CLUTCH ADJUSTMENT (LOWER)

CLUTCH ADJUSTMENT

To check clutch adjustment, stand tiller on front end. Measure the length of both springs at the end of the control cables then move the CLUTCH CONTROL up to the handle bar and measure the extended length of both springs. When properly adjusted the springs should extend 1/4 to 1/2 inches when clutch is engaged. If adjustment is required, reposition the jam-nuts on the threaded ends of the cable conduits. One end of the conduit is located under the handle bar center panel and the others on the right side of the frame. The one in back is for tine rotation and the center is for wheel traction.To increase spring extension, turn the jam-nuts toward the end of cable or to decrease closer to the cable fittings. Additional clutch adjustment can be made if necessary at the idler under the belt cover--refer to BELT TENSION adjustment for this procedure.

CLUTCH TEST: Return tiller to wheels, start engine and pull CLUTCH CONTROL to handle bar then release and observe tines and wheel drive which should stop--if tines or wheels continue after clutch control is released, the clutch spring extension is too great. Readjust using the foregoing procedure.

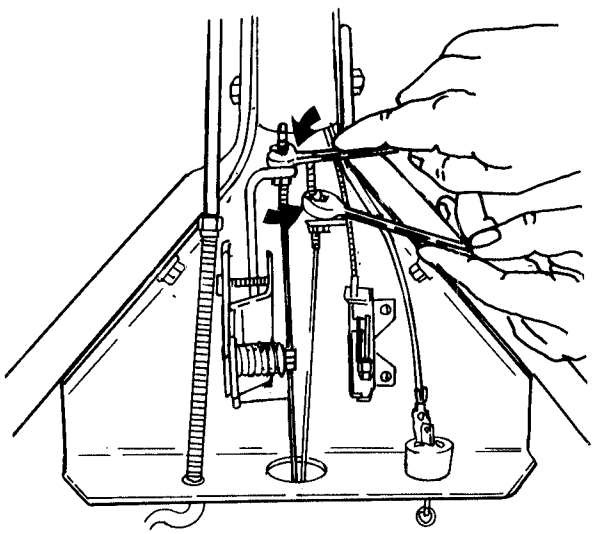


FIG. 1. 13 - CLUTCH ADJUSTMENT (UPPER)

TILLER TINES

The tines are bolted securely to the tine shaft with a special shear bolt (Snapper #1-4586) and locknut (9-0289) on each side. Keep spares on hand in case a bolt shears off or becomes lost while tilling.

The Snapper Tines are sharpened on front and rear edge for forward or reverse rotation. The point of the tines should be the leading edge under all conditions except when used in the forward mode for cultivating (Refer to TINE SELECTION for details).

BELT ADJUSTMENT & REPLACEMENT

BELT TENSION ADJUSTMENT: Stand tiller on end and swing belt cover up to provide access to belt and idler. Pull clutch control to handle bar and observe where idler arm is positioned under the tiller frame. With the belt tight, the idler arm should be approximately parallel to the cross member. If at an angle, adjust idler at driven pulley by loosening capscrew and shifting position of idler until arm is pulled parallel. The spring should be extended 5". Retighten capscrew on idler after adjustment.

BELT REPLACEMENT: To replace the belt, stand tiller on end, swing belt cover up to provide access to belt and idler, move shift lever between position R and 1. Remove capscrew, washer and lockwasher from the V idler under frame then slide idler down bolt to allow slipping belt on and off the pulley. Remove belt by slipping off pulleys and pull out of the frame. To install replacement belt, thread belt thru opening in back of frame, route belt around engine pulley, idlers and belt guide then slide V idler back and secure with the fasteners removed earlier. Use care to insure that belt is kept straight over tiller pulley and idler and in desired tilling mode. Readjust belt tension as required.

DRIVEN DISC SERVICE

If the wheels loose traction, stand the tiller on end and check the rubber driven disc. Poor traction could be caused by an excessively worn driven disc or by improper positioning of the disc. If the rubber disc appears in good condition, shift the transmission into reverse then into #1 forward position. In both settings, the rubber disc should be located outside of the indentation in the center of the metal drive disc. If the rubber disc rides on the edge of indentation in either setting, loosen the screws holding the shift detent to the frame then tilt the detent until the rubber disc is outside the edge of the indentation. Securely tighten the detent screws. The disc should be about equal distance from the outer edge of the indentation in both reverse and #1 positions when properly adjusted.

Replace the driven disc if worn unevenly or if worn down to the point where it no longer makes firm contact with the drive disc. To replace, remove the three flange nuts, slip the old disc off the hub then install the replacement and secure with the three flange nuts.

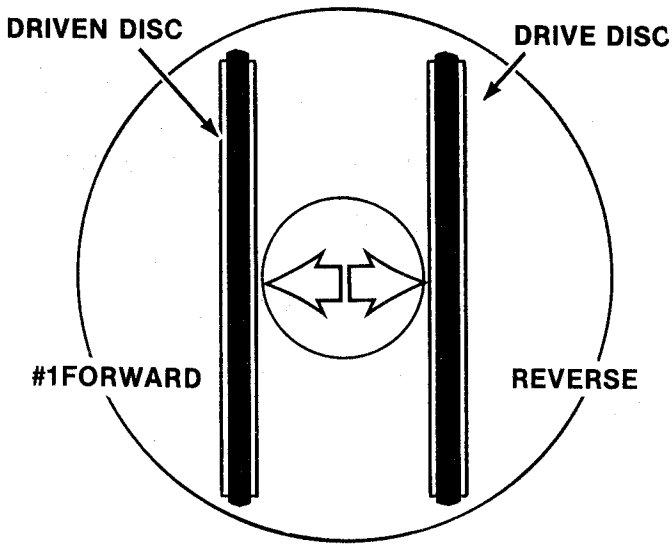


FIG. 1. 14 - DRIVEN DISC POSITIONS

OFF-SEASON STORAGE

Thoroughly clean all external surfaces and tines before storing the Tiller. The Tiller may be stored on end, however, the following steps must be taken.

1. Drain gasoline from fuel system and drain the engine crankcase oil (refer to engine manual for details).

2. After standing the Tiller on end, check the plugs in the chain case for leakage. After extended period, some grease may seep thru upper bearing races.

3. At the start of the new season, replenish engine crankcase oil and add gasoline to the fuel tank after returning the Tiller to its wheels.

4. Before starting, move the ENGINE CONTROL to OFF and pull rope starter slowly several times. If excessive resistance is felt, remove the spark plug and pull rope starter rapidly to spin the engine and clear oil from the cylinder. Clean and reinstall the spark plug before attempting to start the engine.

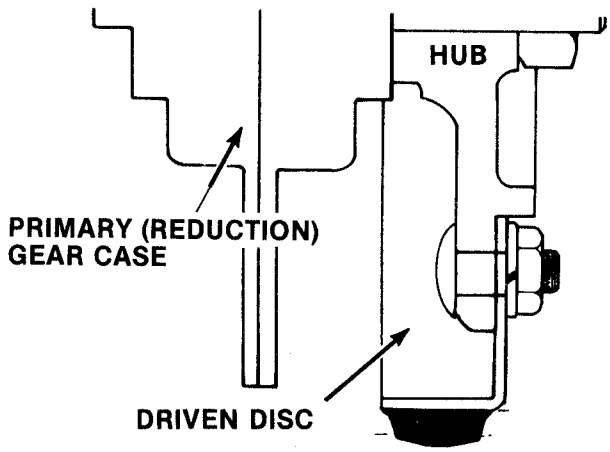


FIG. 1. 15 - DRIVEN DISC DETAIL

ZERO-MAINTENANCE BATTERY

The following applies to models having the Snapper Zero-maintenance 12 Volt DC battery electric start system. This system is standard equipment on RT8S models

CHARGING-ON UNIT: If the battery on a RT8 S model has insufficient energy to crank the engine for starting, rope start the engine and allow it to run at medium to fast speed to restore charge.

CHARGING-AUTO TYPE CHARGER: If the battery charge cannot be restored on electric models by running the engine, it may be too deeply discharged to accept charge. In this event, disconnect and remove the battery from the unit and charge on an automotive type charger at standard rate only with chargers rated up to 12 amps. Charge for 8 hours maximum or until case is warm to touch.DO NOT use 'Boost' buttons or circuits! Let the battery rest for about 2 hours after disconnecting from charger.

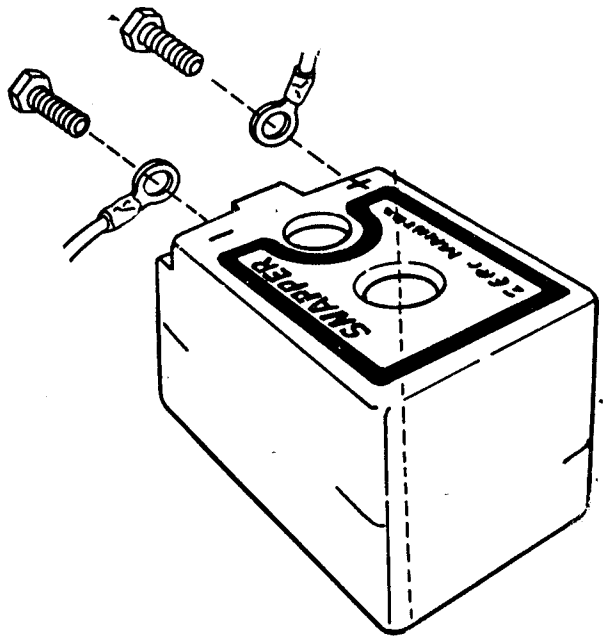


FIG. 1. 16 - ZERO MAINTENANCE BATTERY

STORAGE-OFF SEASON: This battery does not have to be removed or disconnected prior to off-season storage. Bring the charge up before a long period of storage. Store the battery at room temperature whenever possible. Higher temperatures will accelerate the self discharge rate.

SERVICE REQUIREMENTS: As the name ZERO MAINTENANCE implies, the battery requires no service except for an occasional check to insure that the negative & positive wires are securely tightened.

PRECAUTIONS: Keep cigarettes, sparks, flames away from the battery at all times as it may vent explosive gases while being charged. Keep the battery out of reach of children. Do not puncture the case of the battery as it contains acid which can burn skin and injure eyes.

SEALED LEAD ACID BATTERY

This battery can usually be placed in service as received. However, it may be of benefit to give it a short (3 hour) charge before use. Use a charger rated at 2 amps or less unless the charger is an automatic or voltage regulated charger, in which case the charger can be rated as high as 6 amps. Do not charge for more than 24 hours.

When making electrical connections, make sure the red wire is connected to the positive terminal and the black to the negative. When tightening the terminal bolts, be careful not to overtighten and break the battery terminals. Always connect the positive terminal first.

MAINTENANCE

Charge the battery before long periods of storage and every 3 months thereafter. Remove the negative lead from the battery when the battery is being

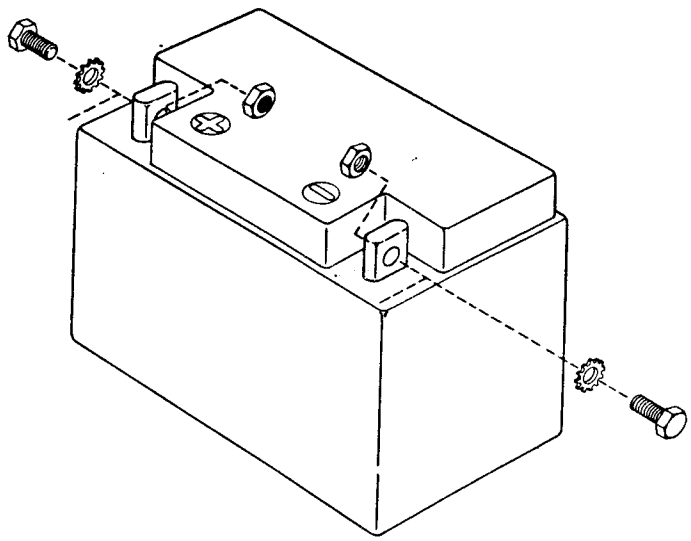


FIG. 1. 17 - SEALED LEAD ACID BATTERY

stored to prevent the battery from discharging. Coat the terminals and connectors with grease to reduce corrosion.

CAUTION This battery contains sulfuric acid which may leak if case is broken. If any acid comes in contact with skin or clothing, follow these instructions:

EXTERNAL CONTACT -Immediately flush skin or eyes with water for at least 15 minutes. Call a physician immediately.

INTERNAL - Drink large quantities of tap water or milk. Take milk of magnesia or whites of eggs. Do not give emetics. Call a physician immediately.

SECTION 2: TROUBLE SHOOTING PROCEDURE

When problems occur, always look for the simplest causes first, even though they may seem too obvious to consider. For example, don't go ahead with overhaul of the chain case without first eliminating other possible and easier to remedy causes for the drive problem: The guide below has been developed with the simplest cause listed first.

PROBLEM	POSSIBLE CAUSE(S) AND PROBABLE REMEDY
WILL NOT START	● THROTTLE CONTROL in stop position - move to run. ● KEY SWITCH in OFF position. ● CHOKE CONTROL not in choke - move to choke position. ● SPARK PLUG WIRE disconnected - reconnect. ● FUEL TANK empty - replenish supply. ● ENGINE IGNITION at fault - disconnect switch wire and check for spark. ● DEFECTIVE SWITCH - check switch continuity
STOPS SUDDENLY	● OUT OF FUEL - replenish supply. ● SPEED TOO LOW for conditions - increase setting. ● TINES JAMMED by impacting solid object - clear tines. ● ENGINE TROUBLE - possible lack of oil, thrown rod, overheating , etc.
RUNS ROUGH	● CHOKE LEFT ON too long - return to no choke position. ● CARBURETOR out of adjustment - adjust carburetor. ● AIR CLEANER DIRTY - service (refer to engine manual.) ● WATER IN FUEL SYSTEM - drain system and add new fuel. ● SPARK PLUG FOULED - service or replace plug. ● ENGINE IGNITION SYSTEM - check per engine service manual.
TINES ROTATE TOO SLOWLY	● SPEED TOO LOW for conditions - increase setting. ● BELT SLIPPING - replace worn belt or correct tension. ● CLUTCH CABLE out of adjustment - correct setting. ● ROTOR SHAFT entwined with roots, vines - remove debris.
TINE(S) STOP ROTATING	● SHEAR PIN missing or broken - replace shear pin. ● BELT BROKEN or slipped off sprocket - replace or correct tension. ● CHAIN BROKEN or off sprocket - repair chain case. ● SPROCKET TEETH sheared - repair chain case. ● KEY IN PULLEY - sheared
OIL LEAKING	● ENGINE DRAIN plug not tight or missing - tighten or replace ● CHAIN CASE overfilled - drain excess to proper level. ● CHAIN CASE CHECK PLUG loose or gasket washer missing. ● CHAIN CASE GASKET broken or housing halves not tight. ● ROTOR SHAFT OIL SEALS faulty - replace seals. ● LEAKING AROUND BEARING - seal bearing and case.

CONTINUED

SECTION 2 - TROUBLE SHOOTING

CONTINUED FROM PAGE 2.1

PROBLEM	POSSIBLE CAUSE(S) AND PROBABLE REMEDY
EXCESSIVE NOISE AND/OR VIBRATION	● ENGINE MUFFLER loose or faulty - tighten or replace. ● ENGINE MOUNTING bolts loose - tighten. ● BELT GUARD loose - tighten fasteners. ● CHAIN CASE damaged internally - overhaul and repair.
SHIFT HANDLE MOVES INTO HIGHER GEARS ON ITS OWN	● SHIFT HANDLE TENSION SPRING too weak - replace spring.
SHIFT HANDLE SLOPPY (DOES NOT POSITIVELY CONTROL DISC MOVEMENT)	● HOLE OVERSIZE in arm structure or shift handle or clevis pin worn - use roll pin to tighten fit instead of clevis pin.
TILLER TOO FAST IN FORWARD SPEED AND WILL NOT DIG	● TINES installed for reverse rotation tilling and belt installed for forward tilling - install tines with arrow pointing in forward direction
TILLER GET STUCK, OR HAS TO PUSH UNIT CONTINUALLY	● TINES AND BELT installed for reverse rotation when ground is too soft - change tines and belt for forward rotation
BELT COMES OFF TINE CASE PULLEY	● BELT too loose - adjust belt. ● BELT GUIDE missing, not adjusted, or old type replace and or adjust belt guide. ● IDLER PULLEY out of alignment - align pulley.

SECTION 3: TILLER UNIT OVERHAUL

INTRODUCTION

On Snapper rear-tine tillers, the tiller unit can be separated from the tractor or traction drive unit. This section covers overhaul and repair procedures for the tiller unit. The tractor unit is covered in section 4.

OIL SEAL REPLACEMENT

If oil leakage develops around the tine output rotor shaft, do not attempt to overhaul the chain drive. Replace seals as follows. Rotor shaft oil seals can be replaced without removing or disassembling the chain case when the Snapper #6-0328 seal puller is available. This puller features a tapered thread which cuts into and grips the seal material allowing it to be pulled.

Two seals are installed on each side of the rotor shaft. The seals are identical but are installed in opposite direction. The outer seal is installed with the lip facing outward to prevent dust and dirt from entering the chain case. The lip of the inner seal is installed on the inside to prevent grease from leaking out of the case.

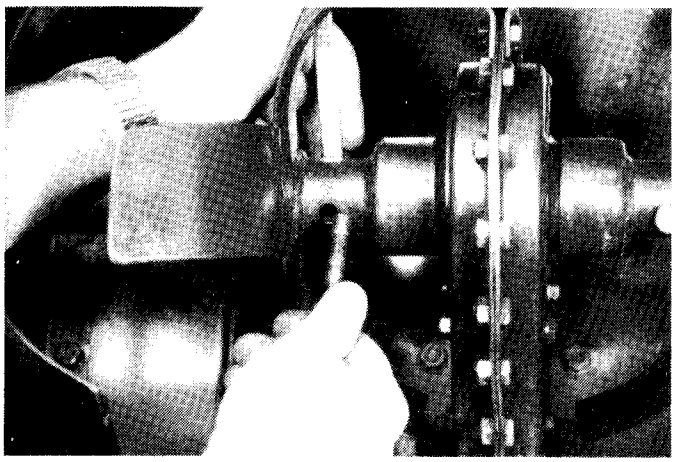


FIG. 3.1 - REMOVING TINES

Proceed as follows to replace faulty seals using the Snapper seal puller. (Figure 3.2). NOTE: Use an awl and thin blade screwdriver to pry seals out if puller is not available.

1. Stand the tiller on its front stand-up bar (after taking necessary precautions as described on page 1.5 of this manual).

2. Remove the tines on both sides of the rotor shaft and clean dirt from the shaft and case. (Figure 3.1)

3. Turn the jackscrew on the puller out where it will not contact the end of the rotor shaft.

4. Install the puller over the rotor shaft and turn it in until the threads engage the outer seal.

5. Turn the jackscrew tight against end of rotor shaft until the seal pops free.

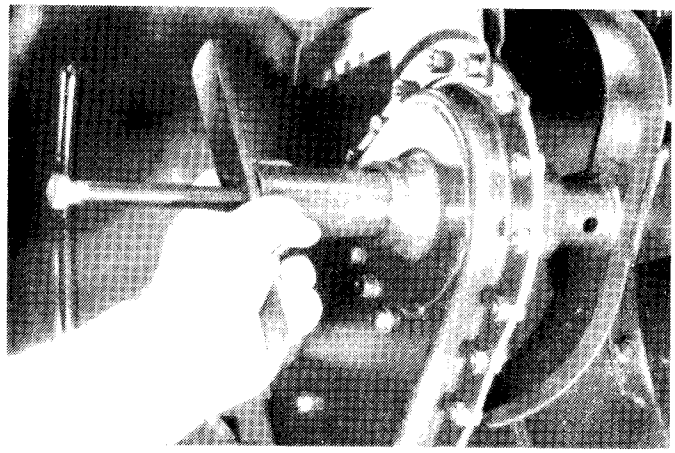


FIG. 3.2 - SNAPPER #6-0328 SEAL PULLER

6. Repeat procedure to remove inner seal.

7. Before installing new seal thoroughly clean the seal seating recess. Look for and remove burrs or weld splatter as this could be causing seal failure.

8. Use emory cloth to remove paint, burrs and sharp edges on rotor shaft. Place masking tape over edges to further prevent cutting seal during installation.

9. Apply small amount of grease to the surface of rotor shaft, then carefully guide the inner seal, with rubber lip toward inside, over edges and onto the rotor shaft.

10. Guide outside seal (with rubber lip facing outside) onto the shaft.

11. Using a seal driver of appropriate diameter, carefully tap both seals into the seal recess until the outer seal is flush with the case and both are snug.

12. After replacing seals on both sides of the rotor shaft, reinstall tines. Check grease and bring up to proper level before operating the tiller.

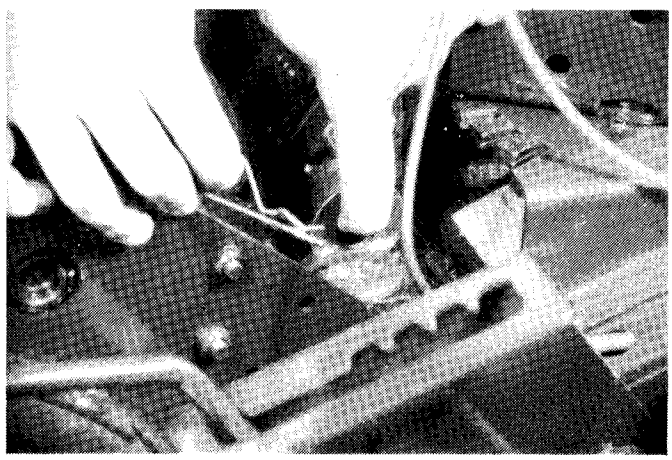


FIG. 3.3 - SEPARATING 8 HP UNIT

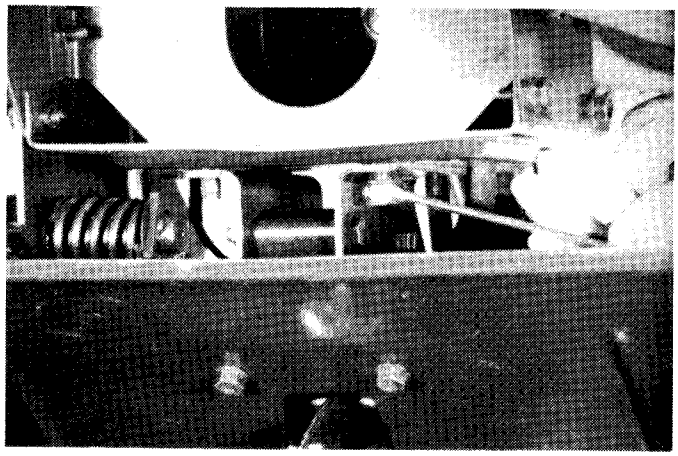


FIG. 3.4 - SEPARATING 5 HP UNIT

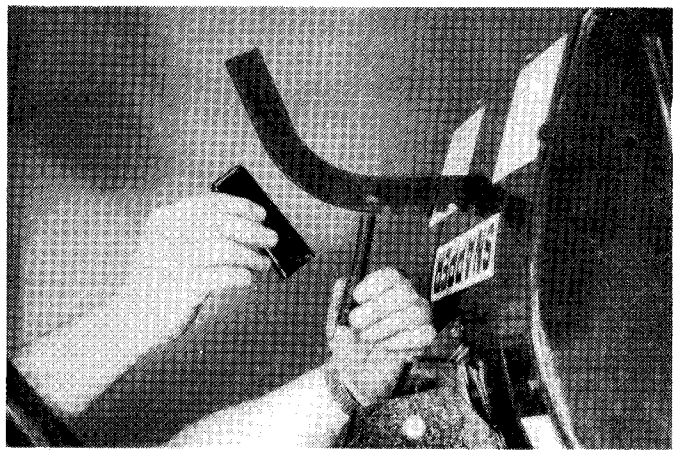


FIG. 3.6 - REMOVE GRIP & SPRING

CHAIN CASE

The chain drive on the rear tine tillers is very similar in design to that used for years on the Snapper front tine tillers. There are, however, certain refinements on the rear tine type. If the tines stop rotating and the cause is not due to the drive belt or broken shear pins, the chain may be broken or off the sprocket gears and or the sprocket gear teeth may be sheared calling for overhaul of the chain case. Although not absolutely necessary, the tiller unit should be separated from the traction drive unit for easier handling during overnaul.

SEPARATING UNITS

Remove the drive belt before separating the tiller unit from the traction drive unit. On 5HP models, remove the four nuts securing the tiller to the tractor unit. On 8HP models simply pull the hair pin and clevis pin to separate the units. NOTE: On later RT8 models, remove two nuts before separating units. With the exception of the mounting method, the tiller units are the same on the 5 and 8 horsepower units. After separating the tiller, move it to a workbench for overhaul.

TILLER DISASSEMBLY

The following procedure is suggested for complete disassembly of the tiller unit.

STEP 1: Remove the tines from the rotor shafts.

STEP 2: Disconnect the spring from the depth bar and remove the grip from the bar. (Figure 3.6).

STEP 3: Remove lower bolt from depth bar retainer plate and pull the depth bar out thru bottom of tiller cover. (Figure 3.7).

STEP 4: Remove the nut securing the chain case pulley, note stack-up of components for correct reassembly later then remove the pulley and guard.(Figure 3.8, 3.9).

STEP 5: Remove the six bolts securing the mounting frame brackets to the tine cover. (Figure 3.10).

STEP 6: Note position of spacers and front brace on frame assembly then remove the nuts securing the long bolts thru the chain case to the brackets. (Figure 3.11).

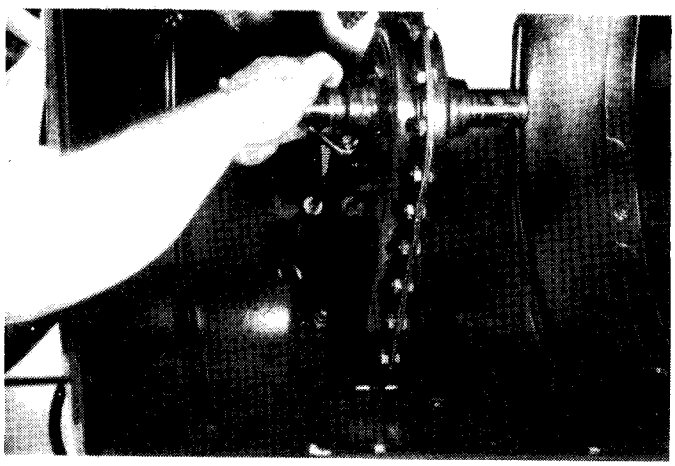


FIG. 3.5 - CLEAN SHAFT AREA

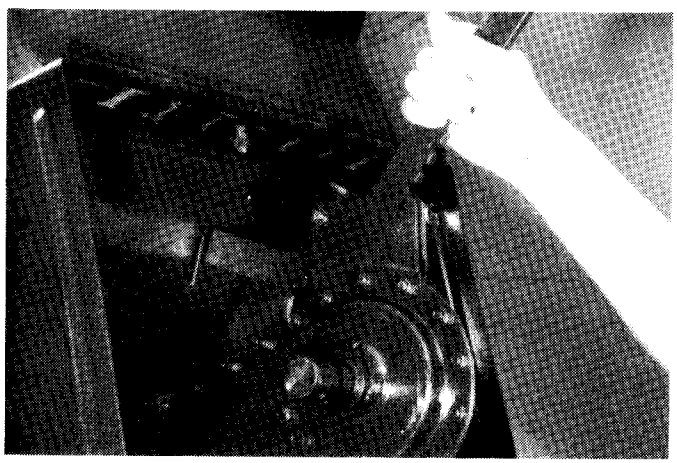


FIG. 3.7 - REMOVE DEPTH BAR

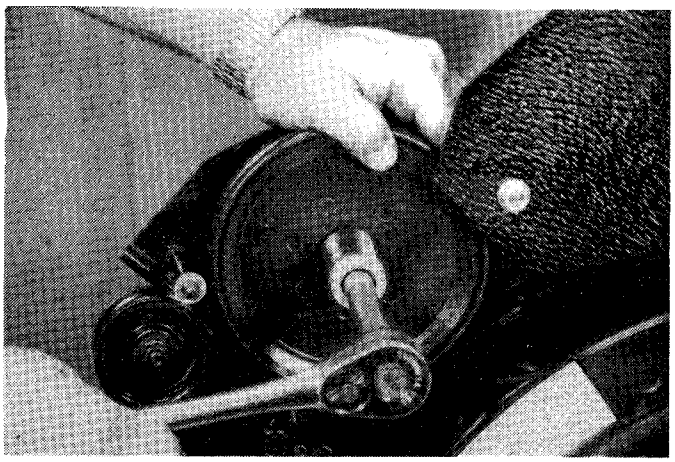


FIG. 3.8 - REMOVE PULLEY NUT

STEP 7: Note position of the pulley shield and cover attachment pin, then remove these items. (Figure 3.12).

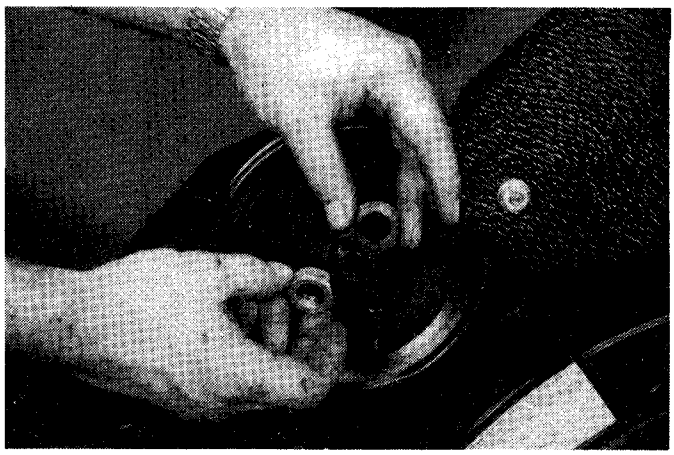


FIG. 3.9 - PULLEY RETAINING HARDWARE

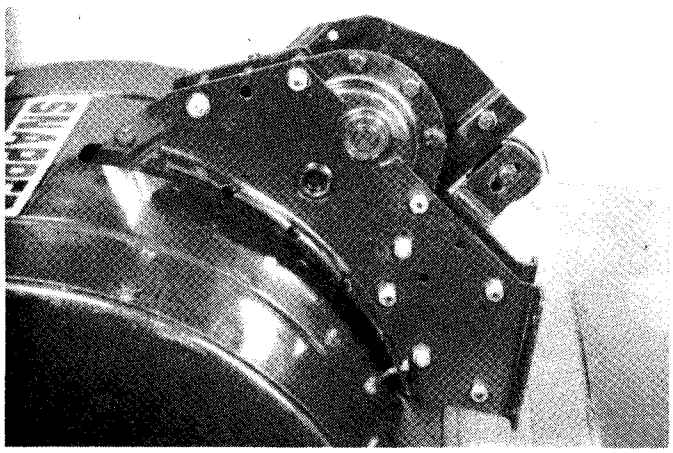


FIG. 3.10 - MOUNTING BRACKET BOLTS

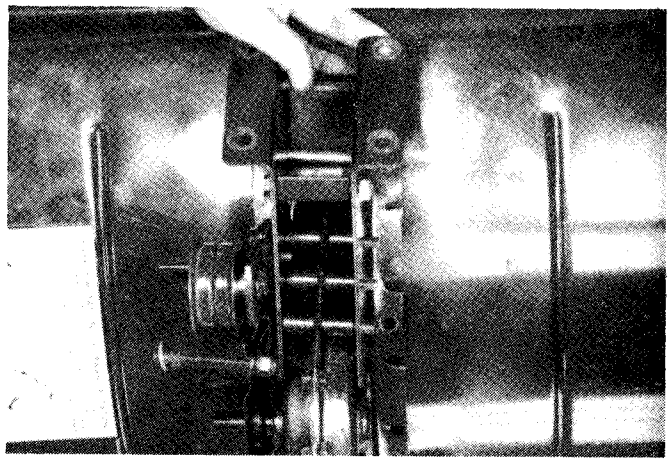


FIG. 3.11 - BRACKET SPACERS & BRACE

STEP 8: The mounting frame assembly can now be removed allowing removal and overhaul of the chain case unit. (Figure 3.13).

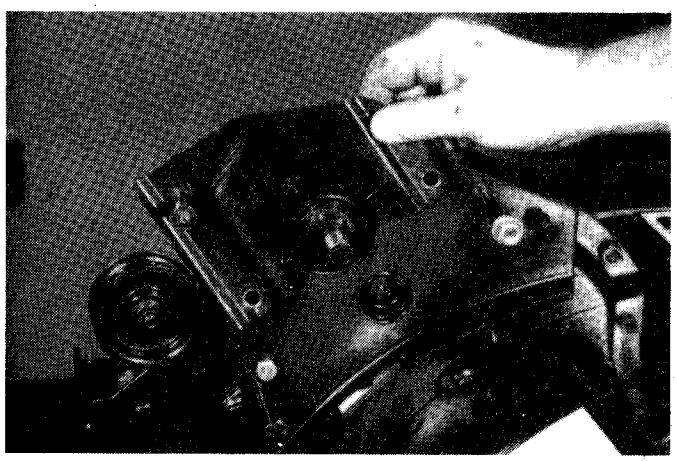


FIG. 3.12 - PULLEY SHIELD LOCATION

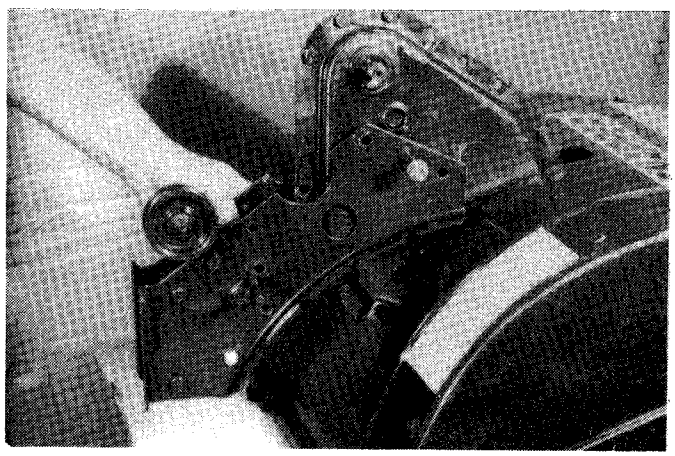


FIG. 3.13 - REMOVING CASE FRAME

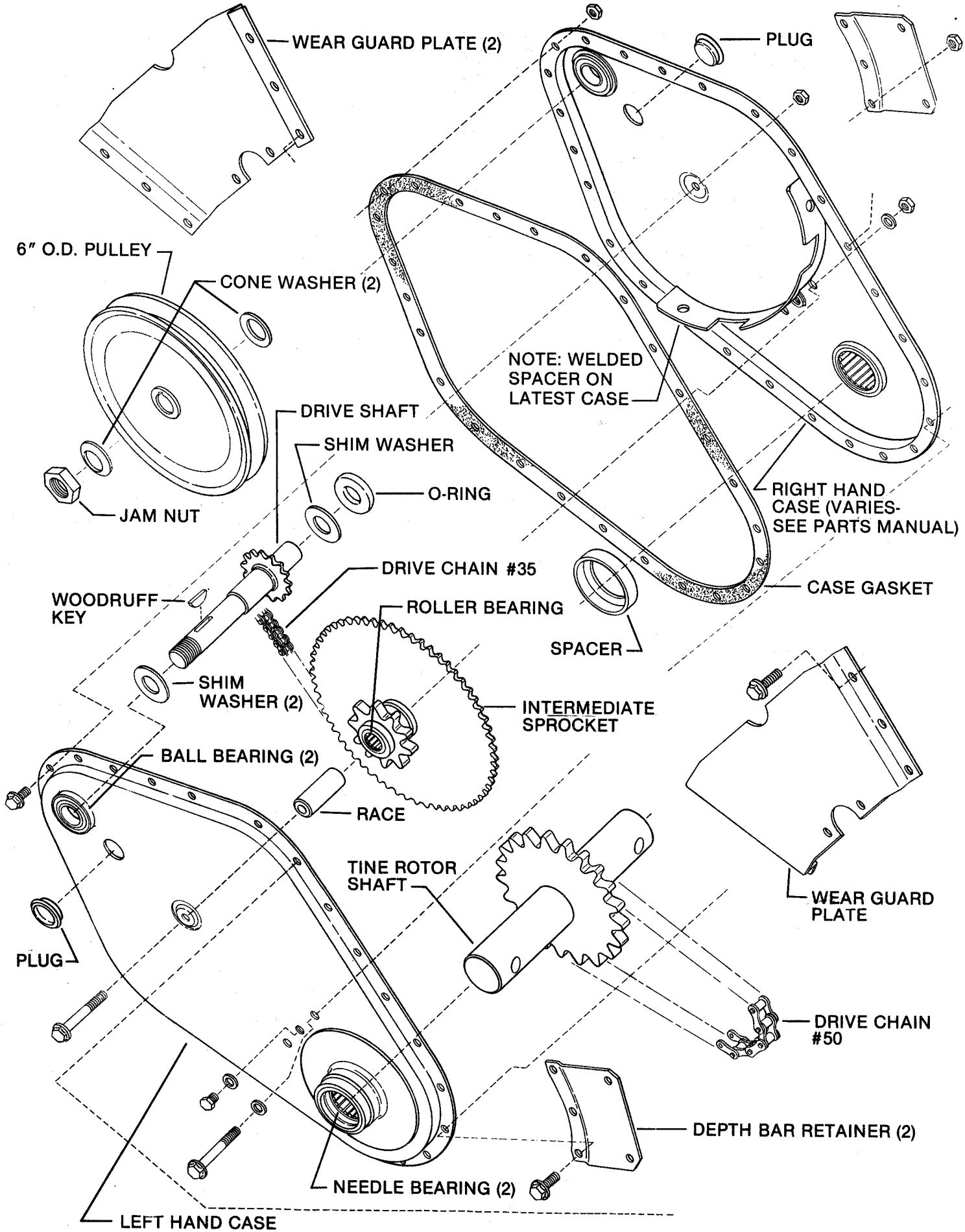


FIG. 3.14 - EXPLODED VIEW OF CURRENT CHAIN CASE ASSEMBLY

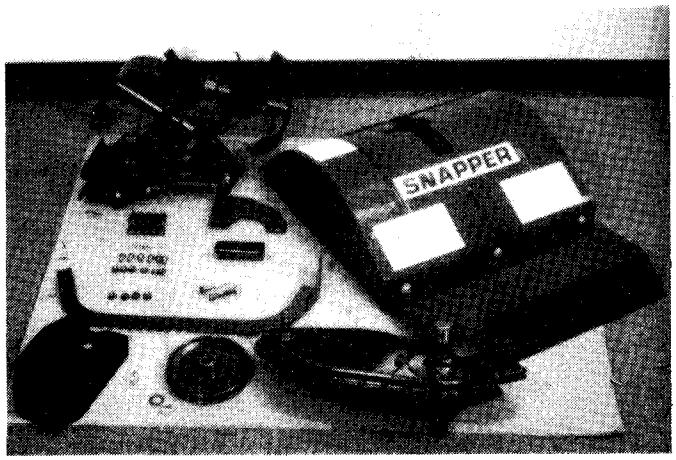


FIG. 3.15 - TILLER UNIT DISASSEMBLED

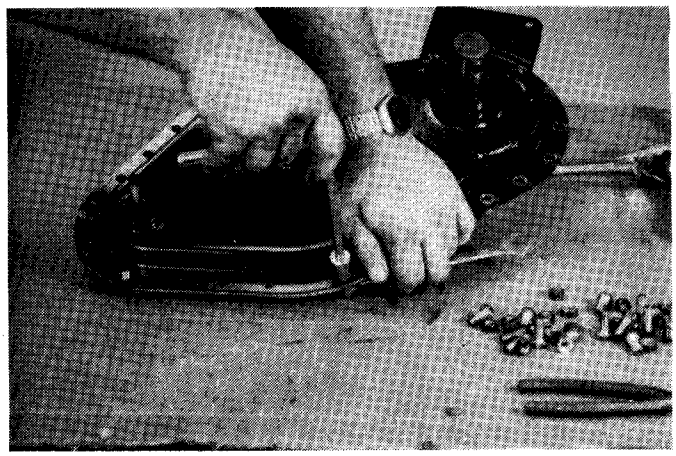


FIG. 3.17 - CASE HALF BOLTS

CHAIN CASE DISASSEMBLY

Remove fill and drain plugs and allow grease to drain out before disassembly of the chain case. The disassembled chain case is shown in the exploded view on page 3.4. Components of the disassembled tiller unit are depicted in figure 3.15.

STEP 1: Remove the key and cone washer from the input shaft. (Figure 3.16).

STEP 2: Remove the bolts securing the case halves together. (Figure 3.17).

STEP 3: Remove the wear plates. Discard and replace with new plates if worn. (Figure 3.18).

STEP 4: Remove the depth bar guide plates as an assembly. (Figure 3.19).

STEP 5: Separate the case halves as shown. Note spacers and reinforcing rib being pointed out in figure 3.20.

STEP 6: Lift the chain sprocket assembly out of the case as an assembly. (Figure 3.21).

STEP 7: While cleaning inside the chain case, carefully inspect for signs of damage or wear. Replace components as needed as follows.

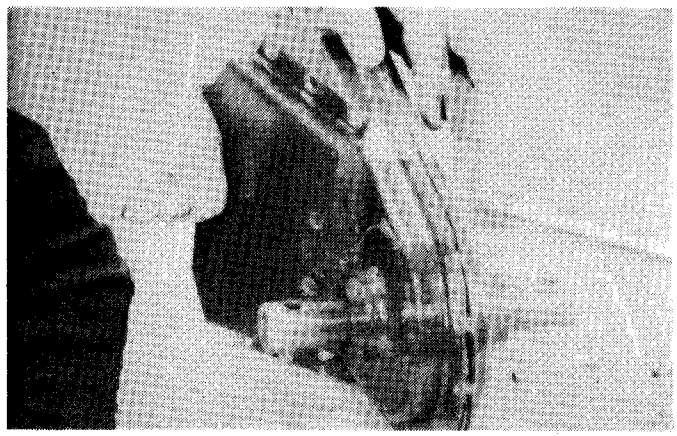


FIG. 3.18 - WEAR PLATE REMOVAL

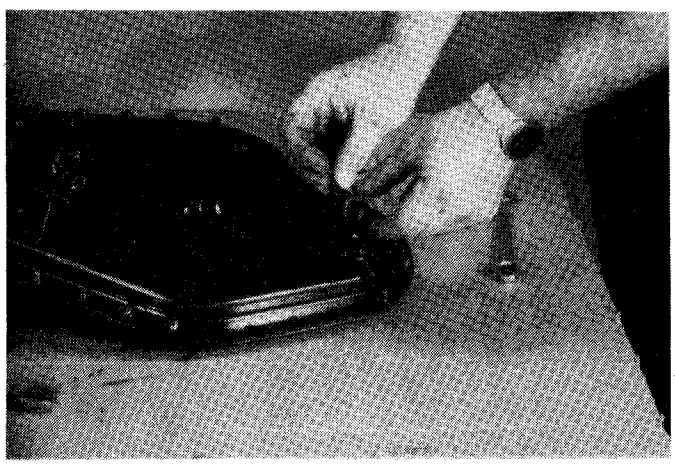


FIG. 3.16 - KEY & CONE WASHER

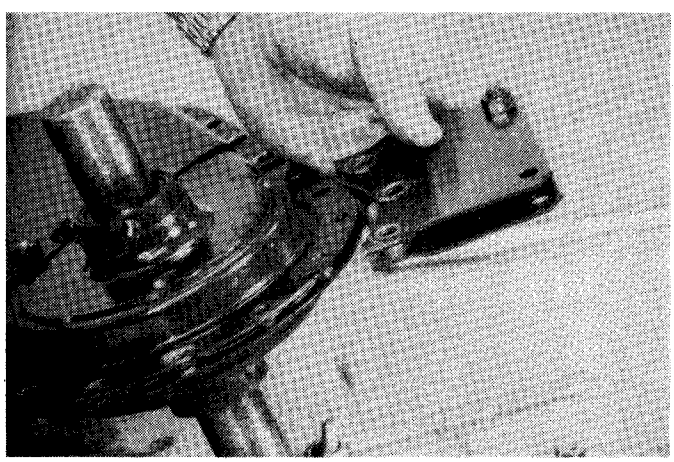


FIG. 3.19 - DEPTH BAR GUIDE PLATES

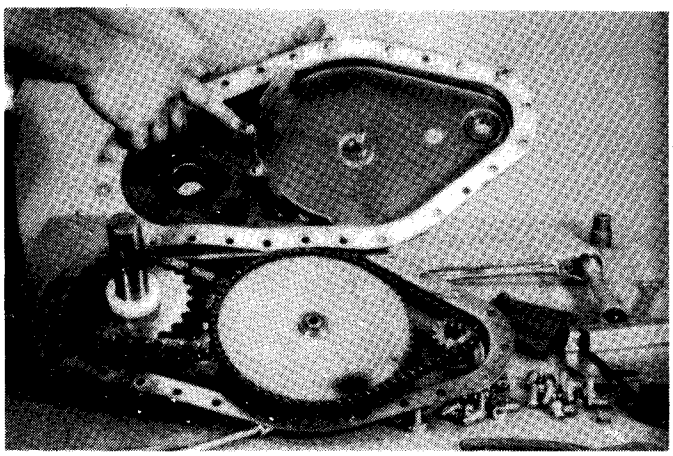


FIG. 3.20 - SEPARATE CASE HALVES

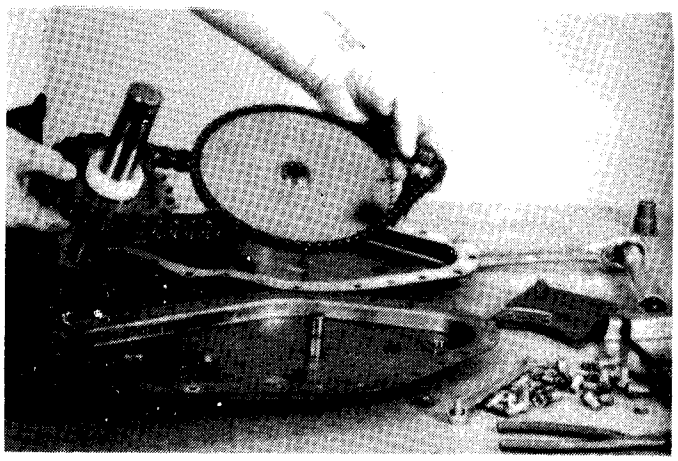


FIG. 3.21 - CHAIN SPROCKET ASSEMBLY

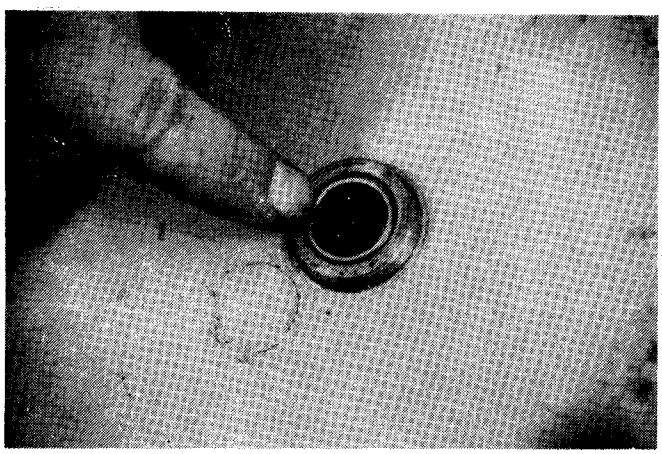


FIG. 3.22 - NEEDLE BEARING

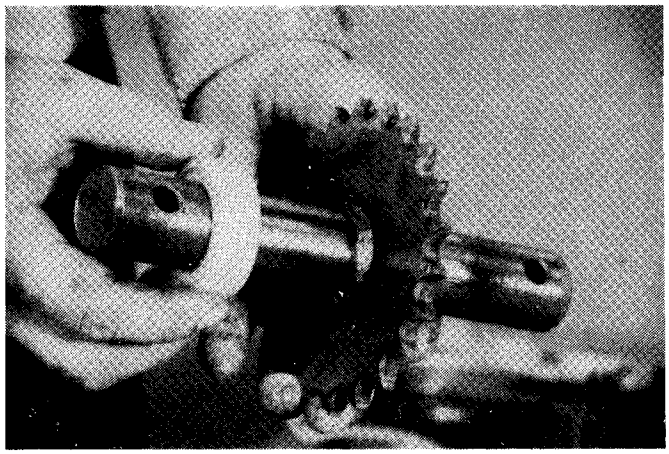


FIG. 3.23 - NYLON SPACER INSTALLATION

CHAIN CASE RECONDITIONING

NEEDLE BEARINGS: The rotor shaft needle bearings are press fitted in case halves. Proceed as follows to replace.

1. Pull oil seals out of recess in case halves.

2. Place round support under bearing seat area and drive or press the bearings out. The bearings can be removed toward either the inside or outside of case.

3. Before installing replacement bearings inspect seating surfaces and remove any nicks, burrs or sharp edges that could interfere with and damage the replacement bearings during installation.

4. The hardened side of the needle bearing has numbering stamped in the surface. The bearings must be driven from the numbered side.

5. Use driver of appropriate diameter to press the replacement needle bearing into place.

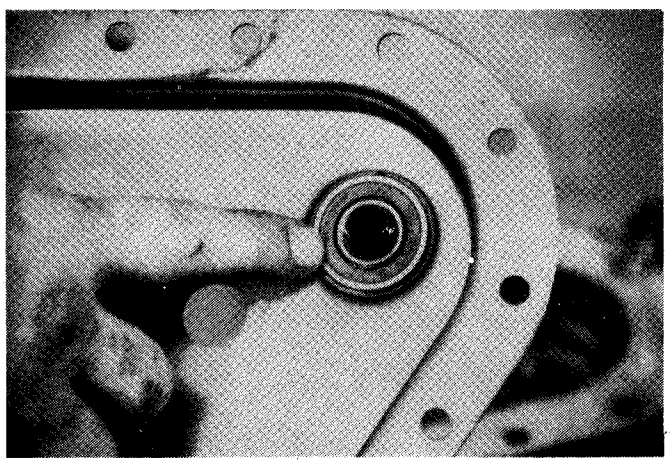


FIG. 3.24 - NUMBERED SIDE INSIDE

INPUT SHAFT BEARINGS: Oil lite type bushings are pressed into the case halves for the input shaft. These bushings have to be pressed out from the inside and pressed in from the outside of the case halves.

1. Remove welsch plug from outside of right side case first, then place support under bearing surface and drive old bearing out from inside of case.

2. Turn right side case over on support and drive new bushing in place from outside surface.

3. Push new welsch plug in right side case. Using punch and hammer strike plug in center to spread it out and lock it in position.

4. On the left side case, the input bushing is located under an oil seal which must be pried out with a screwdriver blade before the old bushing can be removed. Drive old bushing out from inside of case.

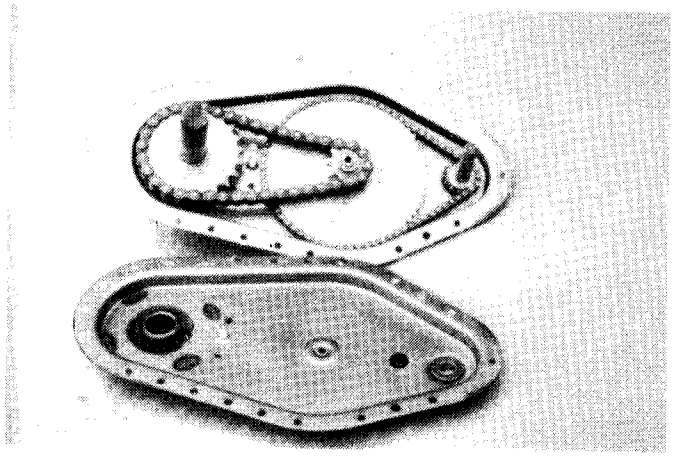


FIG. 3.25 - CHAIN & SPROCKET INSTALLED

5. Carefully inspect bearing and oil seal recess. Thoroughly clean surfaces and remove burrs, sharp edges, etc. Install replacement bushing from outside of case, then install new oil seal with lip facing toward inside of case. Use a seal driver of appropriate diameter to install this seal.

CHAIN CASE REASSEMBLY

Reassembly of the chain case is essentially the reverse of disassembly. There are, however, the following important points involving the reassembly procedure.

1. The nylon spacer shown in figure 3.23 must be installed with cupped area toward the sprocket so that the cup fits over the weld. This spacer must be next to the right hand case when reassembled to give proper chain to sprocket alignment.

2. Since there is not sufficient clearance to work the chains over the sprockets after these are in the case, the chain and sprockets must be assembled and installed in the case as a unit. (Figure 3.21).

3. To avoid leakage problems, always install a new gasket between case halves. (Figure 3.14).

4. Carefully guide the right side case down over the left case after chain drive is installed. Be careful not to damage oil seals when reassembling halves.

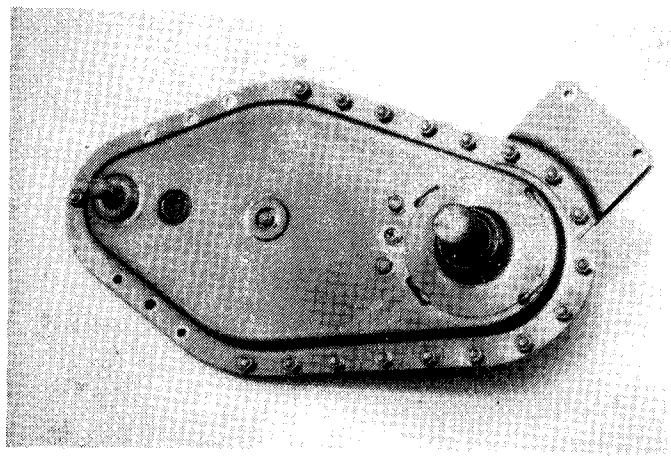


FIG. 3.26 - ADD OIL AFTER RECONDITIONING

5. Reinstall the self-tapping screws and alternate from side to side while drawing the halves together. Use a torque wrench to tighten these screws to 8-10 foot lbs. torque. Tighten the center sprocket bolt to 18-26 foot lbs.

6. Reverse the chain case removal procedure described earlier to reassemble the chain case to the tiller. Remember to add twenty ounces of SAE 90 weight oil to the chain case before operating the tiller.

Notes

SECTION 4: TRACTOR UNIT OVERHAUL

INTRODUCTION

When tractor unit repairs are needed, separate*the tractor from the tiller unit and move the tractor unit to a work bench. Remove the drive belt before separating the units. On 5HP models, remove the four nuts securing the tiller to the tractor (See figure 3.4 on page 3.2). On 8HP models, pull the hair pin and clevis pin to separate the units (See figure 3.3 page 3.1). Note: On later RT8 models it will be necessary to remove two bracket retaining nuts before pulling the pins and separating the units.

*NOTE: SEPARATION NOT ABSOLUTELY NECESSARY BUT MAY BE MORE CONVENIENT

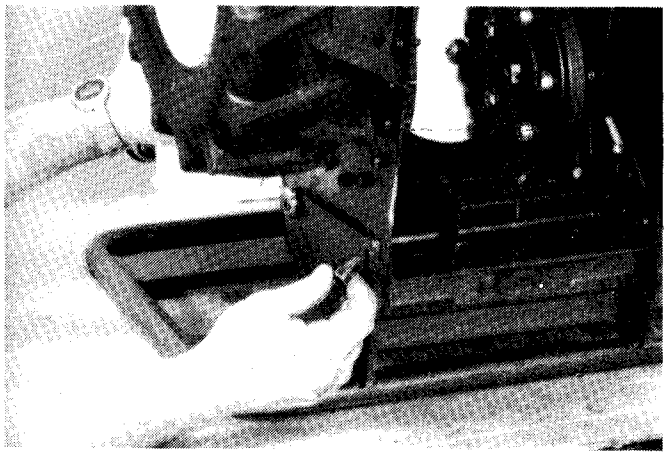


FIG. 4. 2 - REMOVE TWO LOWER BOLTS

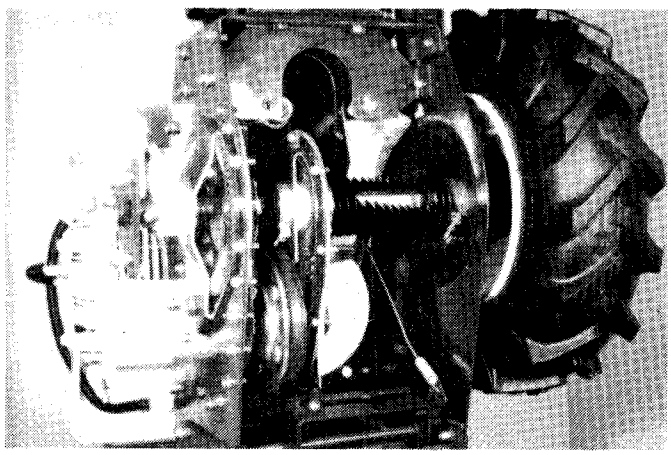


FIG. 4. 1 - TRANSMISSION CUTAWAY

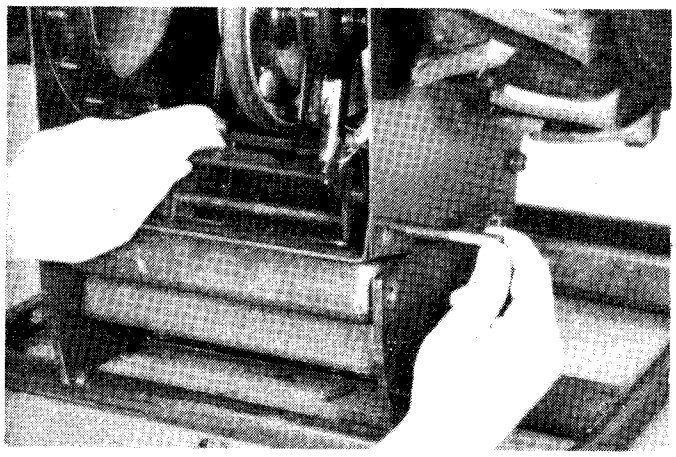


FIG. 4. 3 - REMOVE YOKE ROD

CLUTCH YOKE

Clutch yoke components are mentioned first since they can be replaced without extensive disassembly of the tractor drive unit. To reach the clutch yoke assembly, proceed as follows with unit resting on its stand-up bar.

STEP 1: Remove the two lowest bolts in the stand-up bar (figure 4.2).

STEP 2: Tilt the unit back until the yoke rod installation hole is exposed then pull the rod. NOTE: If the rod does not exactly line up with the hole in frame, run a drill bit thru the hole to allow easy removal of the rod (Figure 4.3).

STEP 3: Disconnect the clutch cable spring from the yoke, remove and replace the damaged yoke components. Reverse foregoing steps to reassemble yoke components and the tractor to stand-up bar.

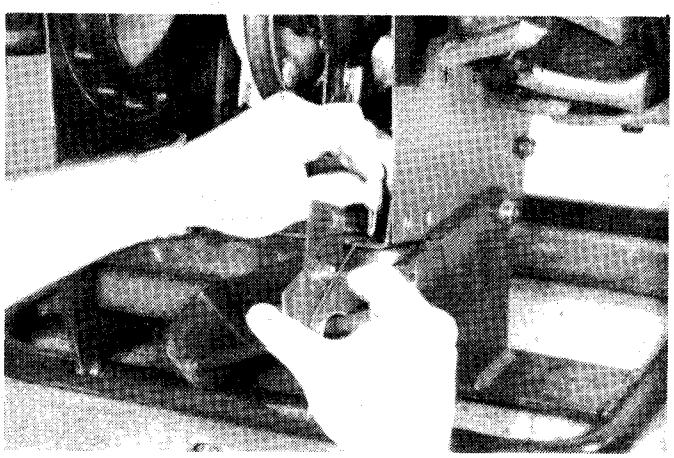


FIG. 4. 4 - REPLACE YOKE COMPONENTS

FIG. 4. 5 - REMOVE STAND-UP BAR

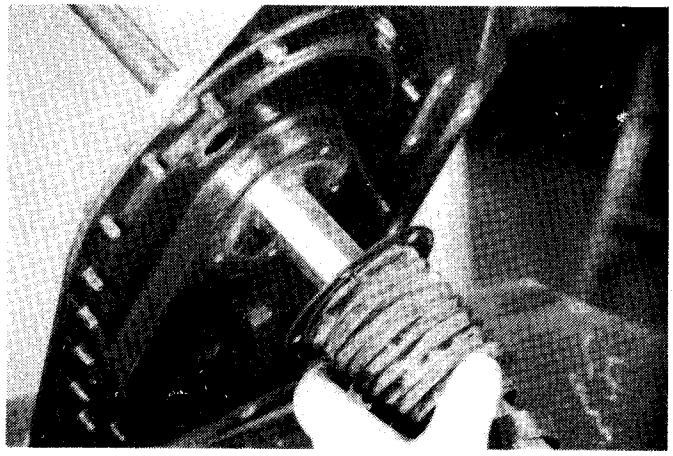


FIG. 4. 8 - BOOT RETAINER REMOVAL

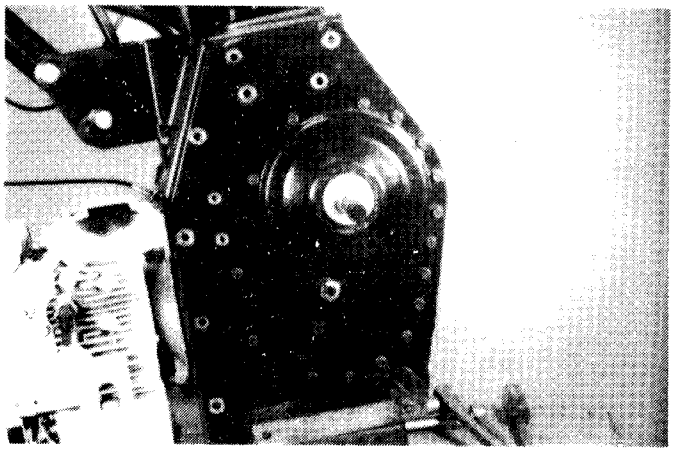


FIG. 4. 6 - REMOVE FENDER/FRAME BOLTS

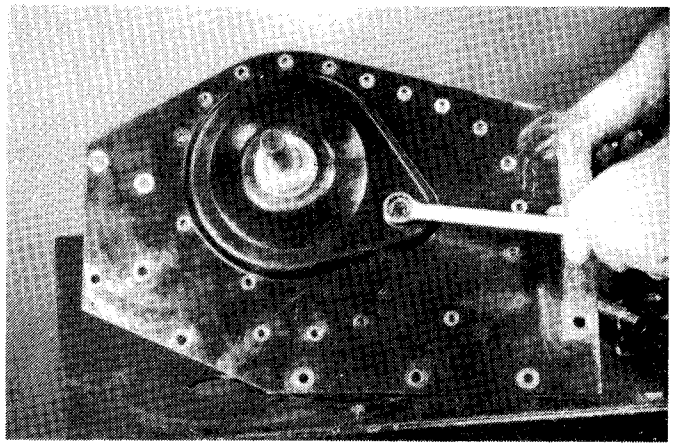


FIG. 4. 9 - IDLER BOLT REMOVAL

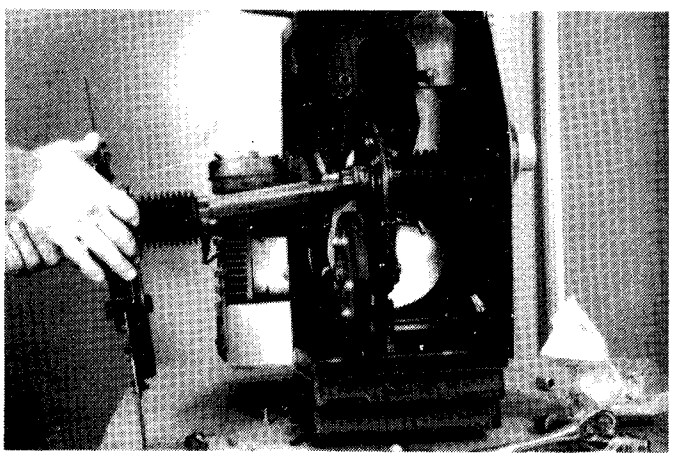


FIG. 4. 7 - PULL GEAR CASE ASSEMBLY

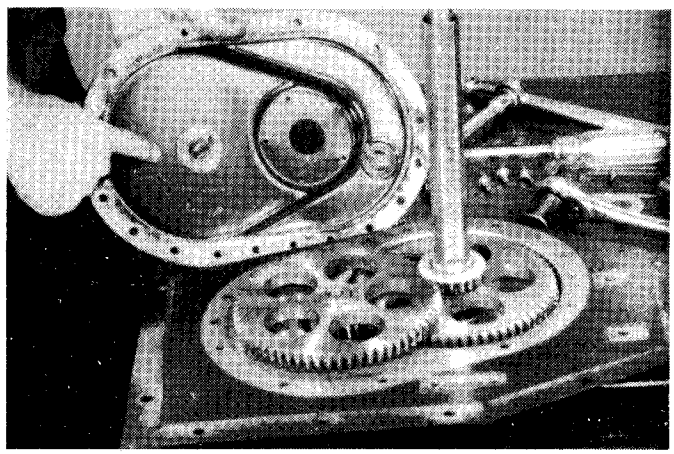


FIG. 4. 10 - NYLON SHIM ON BOTH SIDES

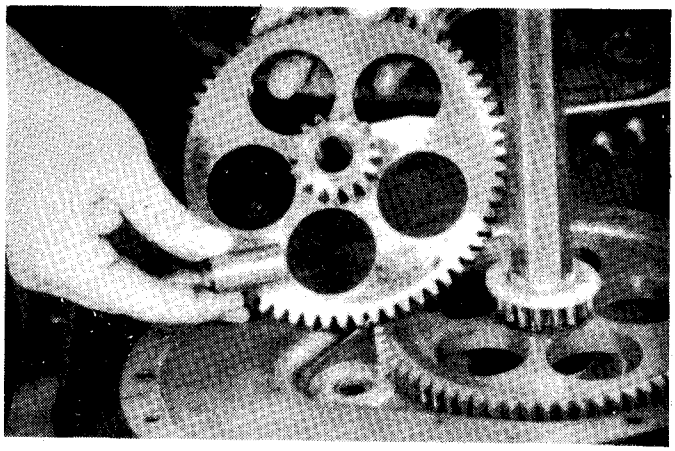


FIG. 4. 11 - GEAR & SPACER REMOVAL

TRANSMISSION

The transmission or gear case is located inside the housing formed by the left side frame and cover. To service, remove the front stand-up bar or bumper then remove both wheels and hubs. Proceed as follows to overhaul and repair gear case components.

STEP 1: Remove the 5/16x1/2 bolts securing the fender to the left side of the frame and the two 1/4 self-tap screws holding the idler bracket, loosen boot clamps, then slide the gear case assembly out to the left (Figures 4.7

STEP 2: Remove the five #10x1/4 self tapping screws and remove the boot retainer from the inside cover of the transmission (Figure 4.8).

STEP 3: To separate the frame from the gear case cover, remove the 1/2Fx1-7/8" gear retaining bolt and nut, then the eighteen 1/4Fx1/2 bolts and locknuts (Figure 4.9).

STEP 4: A hole in the workbench large enough to accept the axle shaft will help in further disassembly. Pull the frame cover off over the short axle shaft end (Figure 4.10). Note location & condition of parts before continuing.

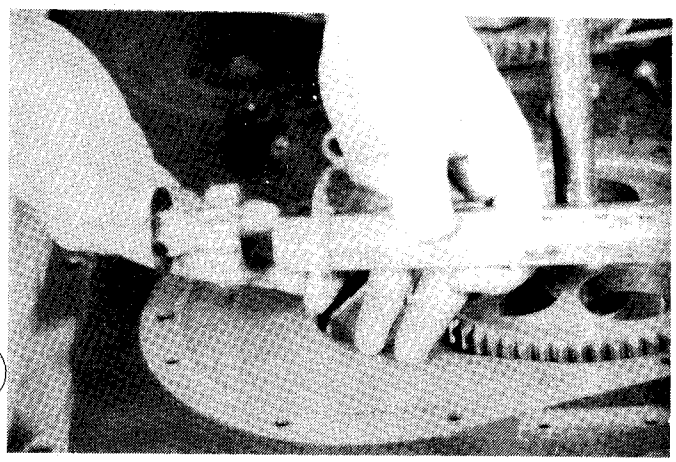


FIG. 4. 12 - HEX TUBE GEAR & BUSHINGS

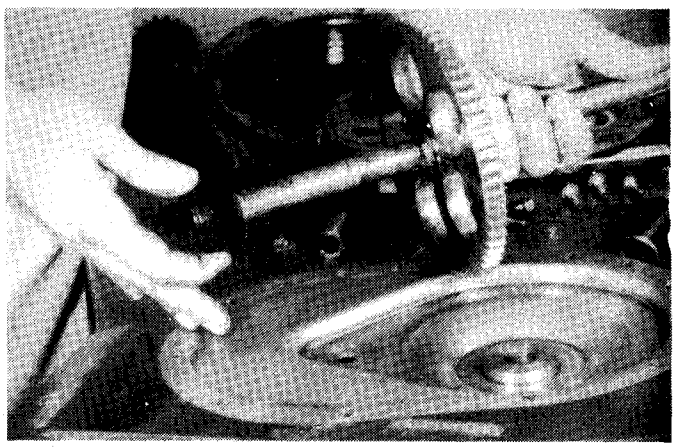


FIG. 4. 13 - SPACER & THRUST WASHER

STEP 5: Pull the gears out of the fender frame and carefully inspect for wear or damage. Replace items as needed (Figure 4.12). Note spacer.

STEP 6: Check the oil impregnated bushings on both ends of hex tube. Check to make sure the gear is a light press fit on the hex shaft. Replace if loose fitting to prevent assembly problems later (Figure 4.13).

STEP 7: Pull the gear-axle for inspection. Note position of the spacer and thrust washer on short shaft end. If replacing the gear-axle make sure the correct assembly is used for the model involved. Check the parts manual (Figure 4.14).

STEP 8: Carefully inspect the axle bearing pressed into the fender frame. Press new in place if needed. Check and replace the nylon grease seal on outside of the fender bearing (Figure 4.15).

STEP 9: Reassemble transmission components in reverse sequence of foregoing steps or refer to figure 4.15 for sequence in exploded view. Remove the primary chain case before reinstalling the transmission if primary chain case repairs are needed.

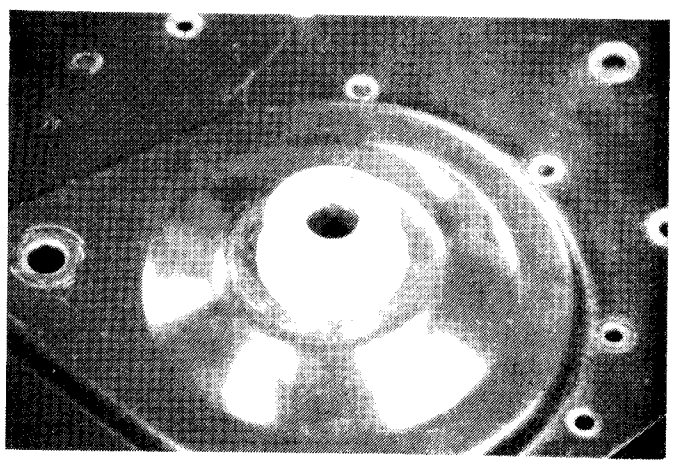
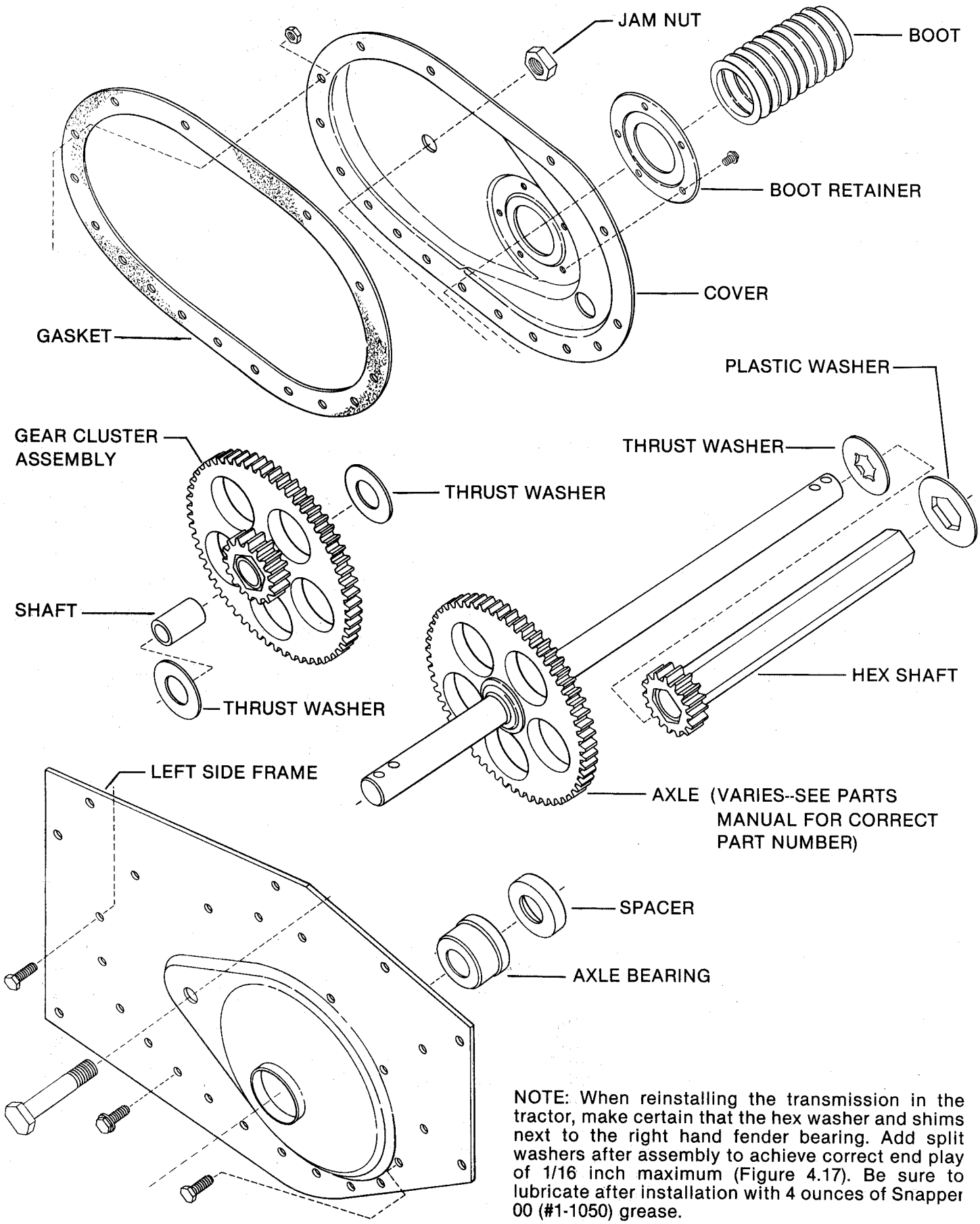


FIG. 4. 14 - AXLE BEARING IN FRAME



NOTE: When reinstalling the transmission in the tractor, make certain that the hex washer and shims next to the right hand fender bearing. Add split washers after assembly to achieve correct end play of 1/16 inch maximum (Figure 4.17). Be sure to lubricate after installation with 4 ounces of Snapper 00 (#1-1050) grease.

FIG. 4. 15 - EXPLODED VIEW OF TRANSMISSION/RIGHT FENDER

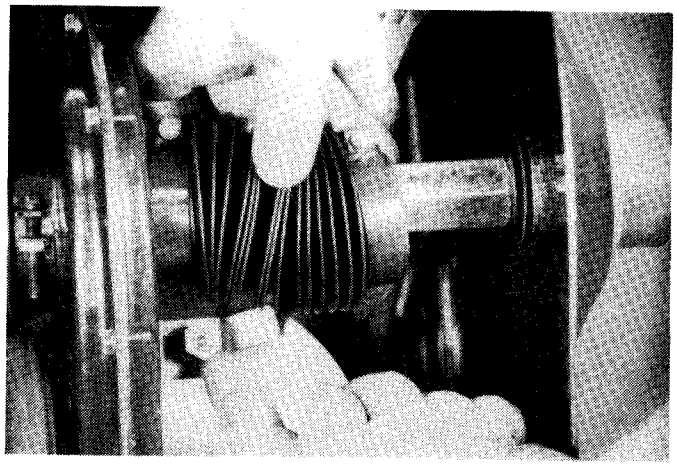


FIG. 4. 16 - DISCOUNT SHIFT LINKAGE

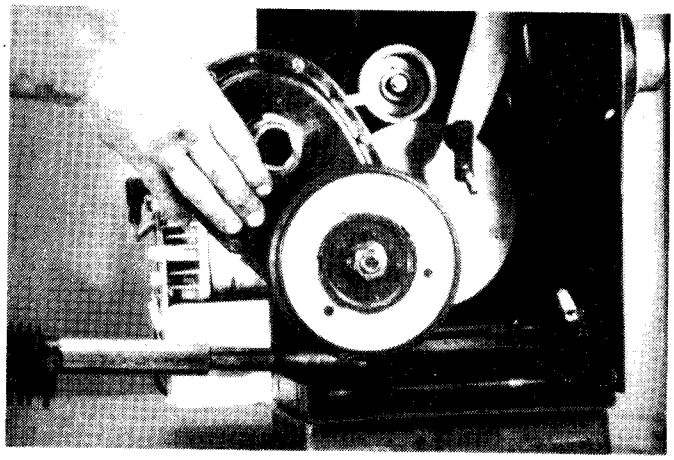


FIG. 4. 17 - TWIST ASSEMBLY SIDEWAYS

PRIMARY CHAIN CASE

The primary chain case is easily removed for overhaul and repair when the transmission is pulled. The primary chain case in the rear tine tiller is almost identical to the assembly used for years on Snapper rear engine riding mowers. Recondition the primary chain case as follows:

STEP 1: The primary chain case is attached to the shift linkage by the short shift link. Remove the nut and twist the assembly sideways to remove (Figure 4.17). Refer to figure 4.18 for location of components.

STEP 2: Remove the drain plug and allow grease to drain then remove the screws securing the case cover to the sprocket cover.

STEP 3: Separate case halves by prying apart. Thoroughly clean and inspect components for wear and/or damage.

STEP 4: If hub-sprocket or sprocket bearings have to be replaced, press these out toward the inside of case and reverse direction when installing replacements. NOTE: Earlier production models used bushings for hub-sprocket. Replace these with needle bearings. Refer to the parts manual for part numbers.

STEP 5: Reassemble chain case in sequence shown in figure 4.18 and reinstall to tiller after adding not more than 2 ounces of Snapper 00 grease.

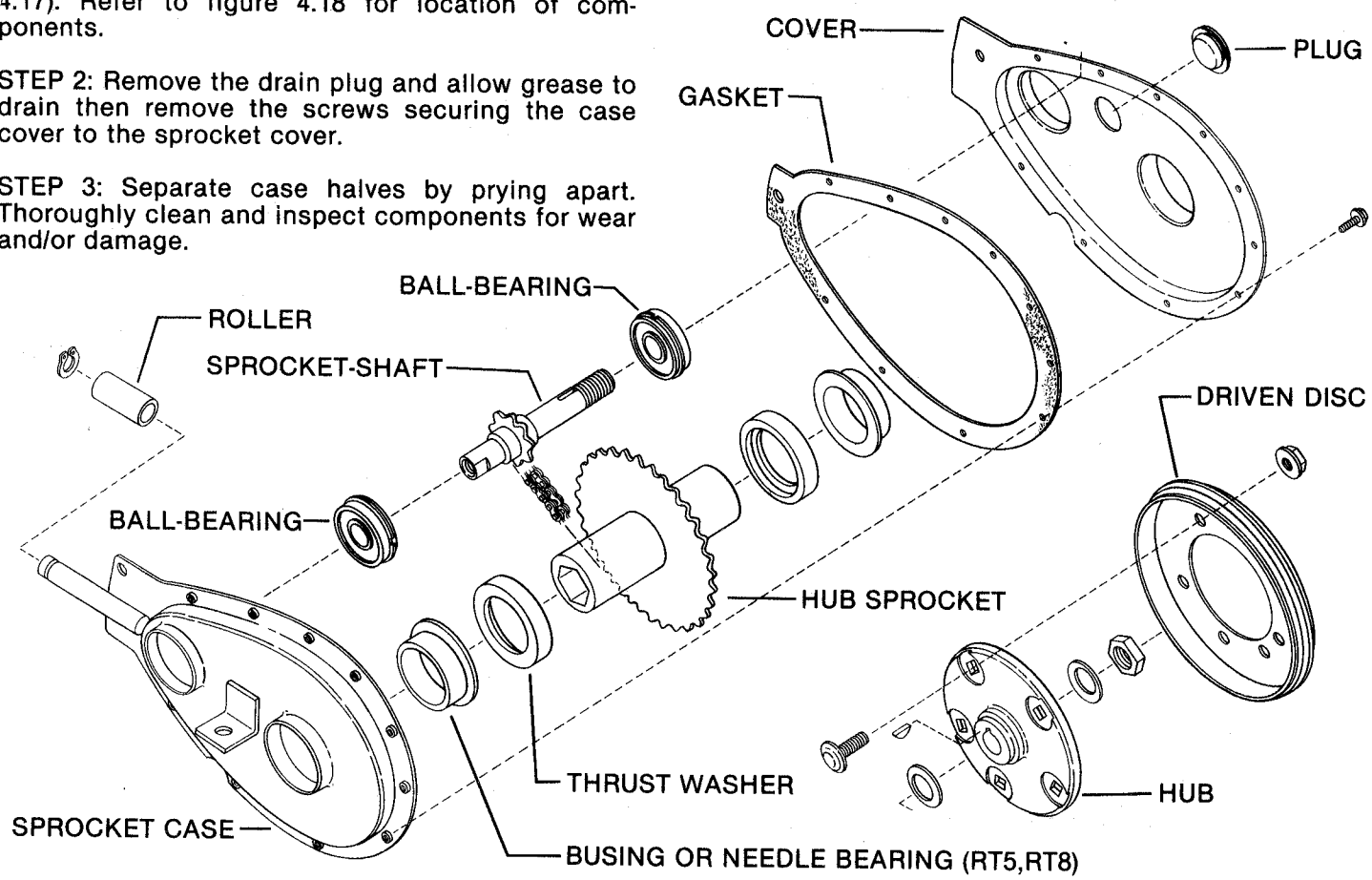


FIG. 4. 18 - EXPLODED VIEW OF PRIMARY CHAIN CASE

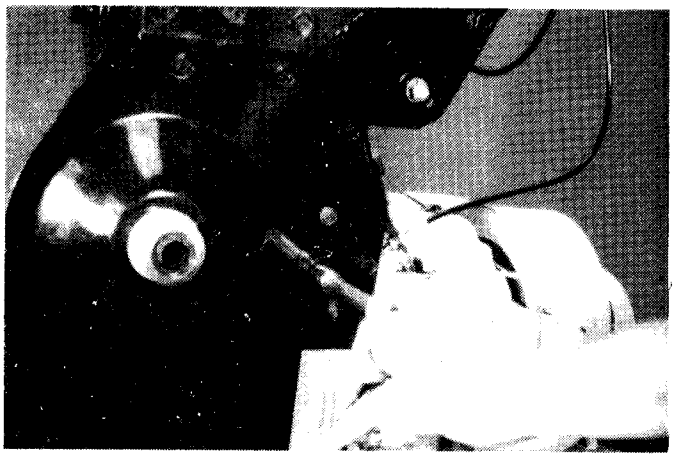


FIG. 4. 19 - IDLER BRACKET BOLTS

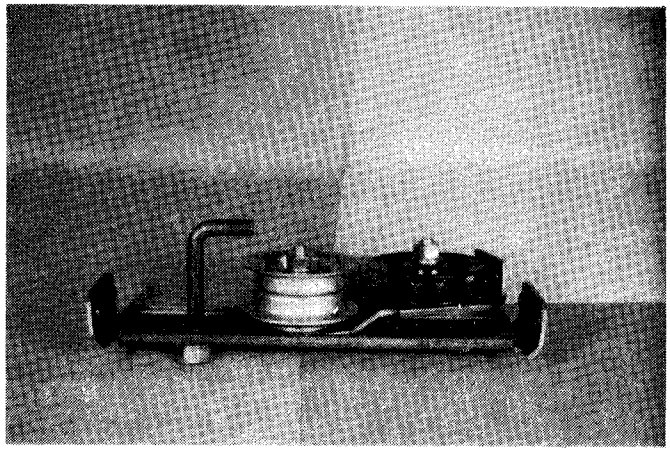


FIG. 4. 21 - OLD STYLE - DISCARD

BELT IDLER

The belt idler bracket is attached to the side frames by four 1/4x3/8 self tapping screws, two on each side. Remove the screws (Figure 4.20), belts, disconnect the clutch spring (Figure 4.21) and remove the idler assembly. NOTE: The idler has been redesigned to provide better belt control. If the idler assembly is of the earlier design as shown in figure 4.22, it should be replaced by the later unit shown in figure 4.29. The same applies to the earlier idler arm & pulley shown in figure 4.23. Replace it with the new style unit shown in figure 4.29. Refer to the rear tine tiller parts manual for correct part numbers. Recondition new style idler as follows:

STEP 1: Remove belt and both wheels.

STEP 2: Remove the two self-tapping screws from each side of the frame (figure 4.19).

STEP 3: Loosen idler assembly and disconnect the cable spring.

STEP 4: Shift transmission into 4th and pull the idler assembly out the top (or shift into REV and pull out thru bottom,) Note: If drive disc or pulley are broken, the engine should be removed to make access to the idler assembly easier.

STEP 5: Completely disassemble the unit down to the idler bracket (Figure 4.24) and carefully inspect components as removed.

STEP 6: Begin rebuilding procedure by inserting the 5/16x2 hex head capscrew thru bracket as shown in figure 4.26, install spacer then idler arm and the larger 11/32" flat washer (Figure 4.26).

STEP 7: Install fixed pulley as shown in figure 4.27 and secure with a 5/16 split lockwasher and 5/16 hex nut (Figure 4.28).

STEP 8: Secure the idler pulley to the threaded portion of the idler arm with a 3/8" flat washer next to pulley, split lockwasher and 3/8Cx1-1/2 hex head capscrew (Figure 4.29).

STEP 9: After reinstalling reconditioned or new idler unit, the belt routing should be as shown in figure 4.30.

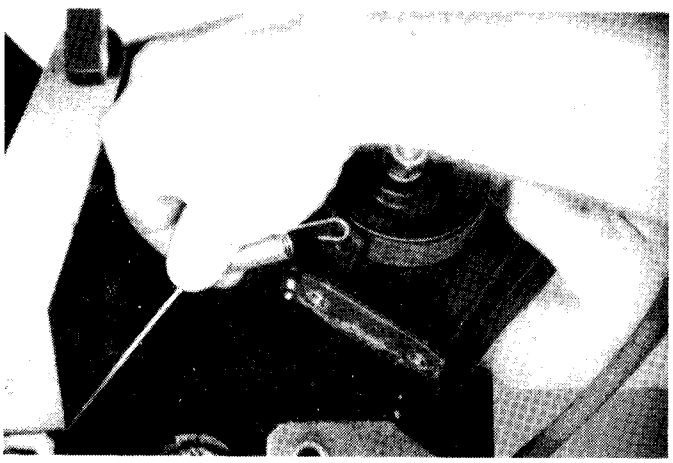


FIG. 4. 20 - DISCONNECT CLUTCH SPRING

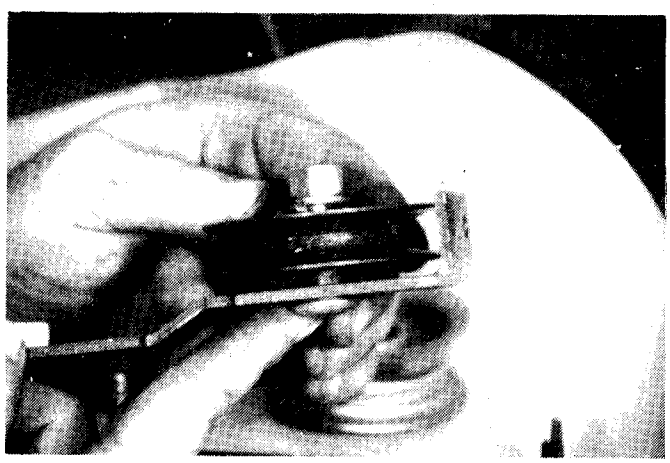


FIG. 4. 22 - OLD STYLE IDLER ARM

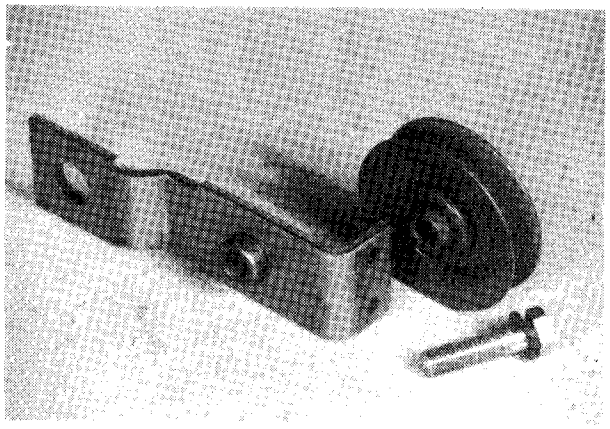


FIG. 4. 23 - IDLER ARM DISASSEMBLED

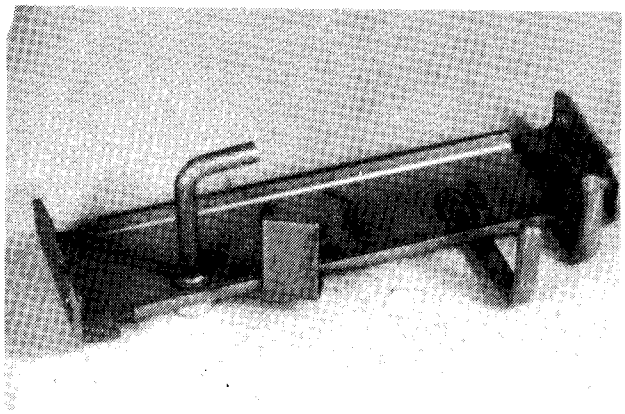


FIG. 4. 24 - IDLER BRACKET & BELT GUIDE

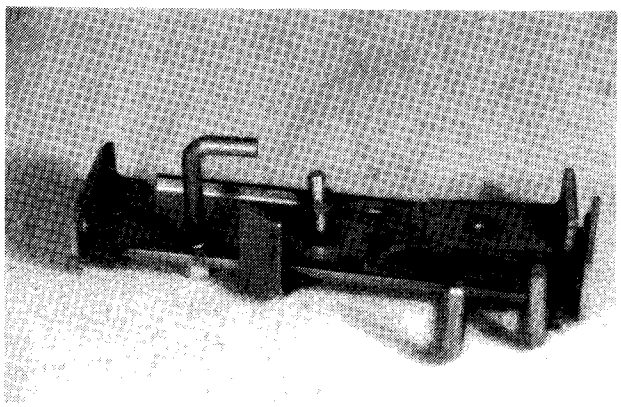


FIG. 4. 25 - SPACER INSTALLED OVER ARM

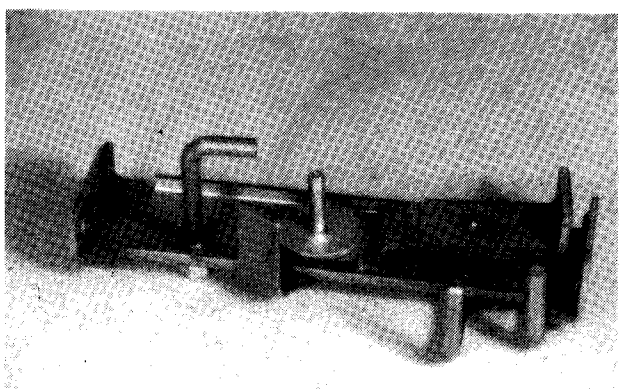


FIG. 4. 26 - LARGE FLAT WASHER OVER SPACER

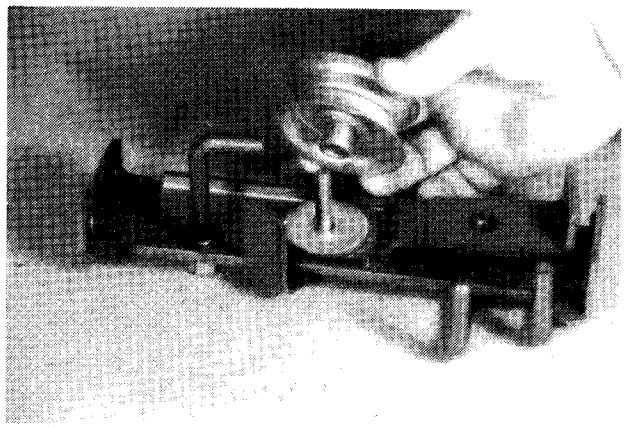


FIG. 4. 27 - IDLER INSTALLED OVER WASHER

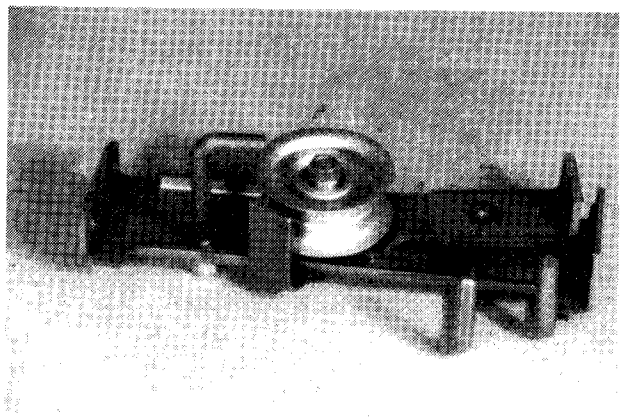


FIG. 4. 28 - SPLIT LOCKWASHER & NUT INSTALLED

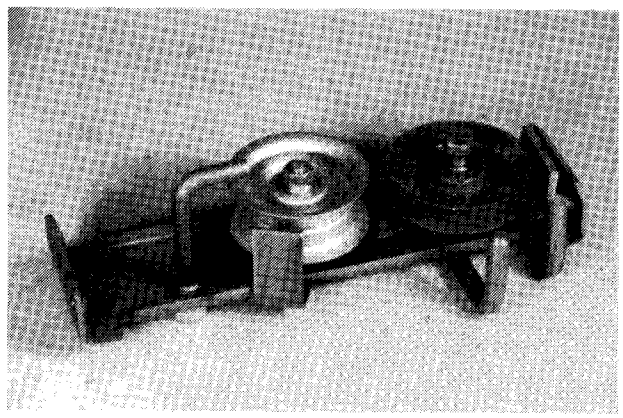


FIG. 4. 29 - BELT IDLER INSTALLED

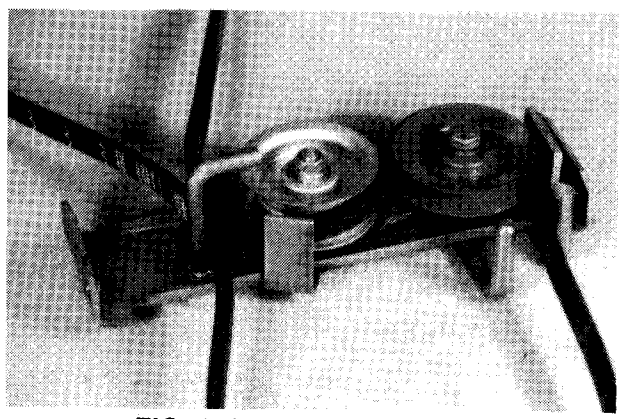


FIG. 4. 30 - BELT ROUTING

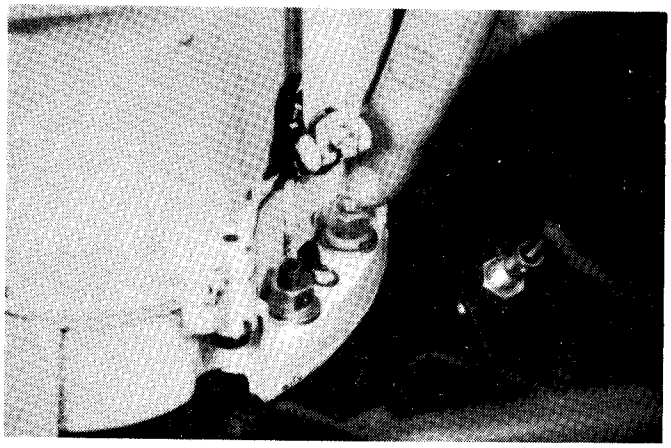


FIG. 4. 31 - ENGINE TO FRAME

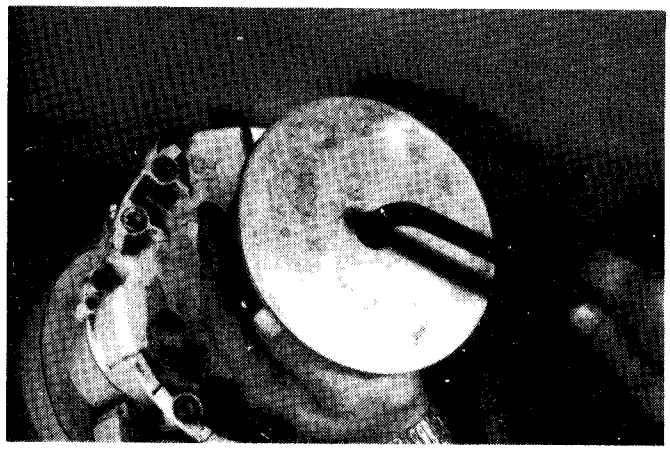


FIG. 4. 33 - DRIVE DISC MOUNTING BOLT

DRIVE DISC REPLACEMENT

Engine power is transmitted by the aluminum drive disc which is attached to the engine crankshaft to the rubber driven disc which in turn transmits the power to the primary chain case and to the transmission assembly. Replace the disc if worn, grooved or warped as follows.

STEP 1: Remove the engine from the tractor frame (Figure 4.31). Note the engine mount shims used on 5HP models. (figure 4.32)

STEP 2: Use an allen head wrench to remove the drive disc mounting bolt (figure 4.33) and lockwasher (figure 4.34). Different size bolts are used and an internal tooth lockwasher is used on 5 HP models while the 8 HP uses the split lockwashers as shown.

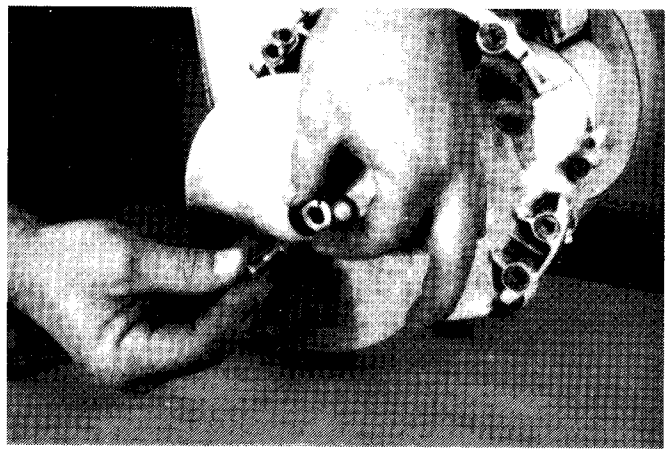


FIG. 4. 34 - RETAINING HARDWARE STACK-UP

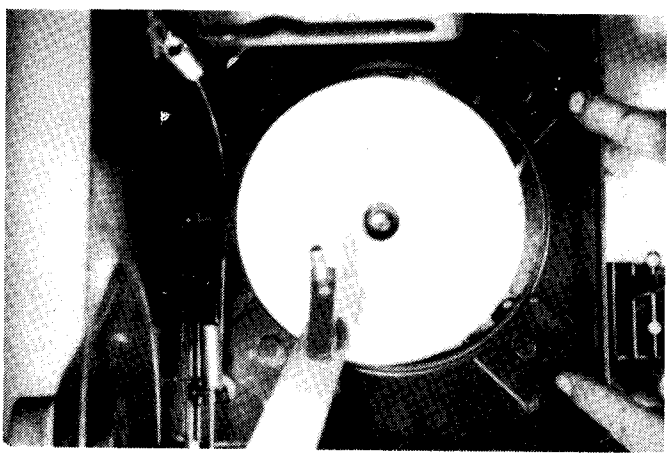


FIG. 4. 32 - SHIMS ON 5HP MODELS

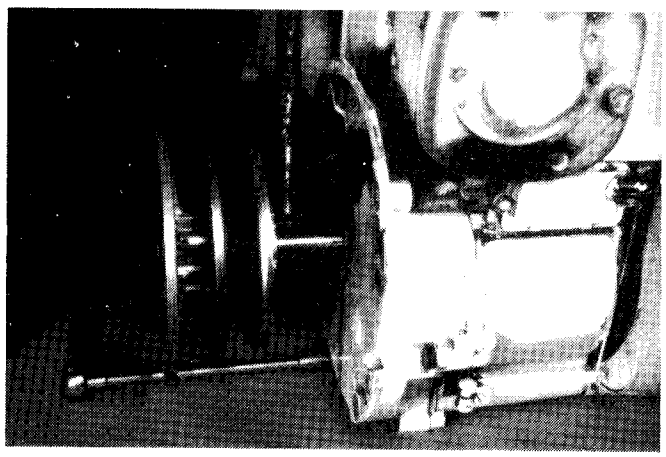


FIG. 4. 35 - PRY DRIVE DISC ASSEMBLY OFF

DRIVE DISC

STEP 3: Use a wooden handle to pry the drive disc/pulley assembly off the crankshaft (figure 4.35). Don't overlook the square key when reinstalling the drive disc (figure 4.36).

STEP 4: Separate the pulley from the drive disc by removing the three l/4x5/8 thread forming screws. Use new screws whenever replacing the drive disc (figure 4.37). Carefully inspect drive disc and pulley and replace components as needed (figure 4.38) before reassembling and reinstalling on engine.

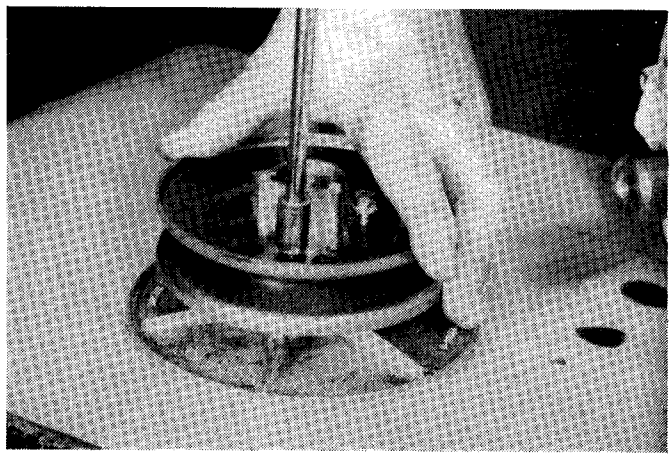


FIG. 4. 36 - SQUARE KEY REMOVED

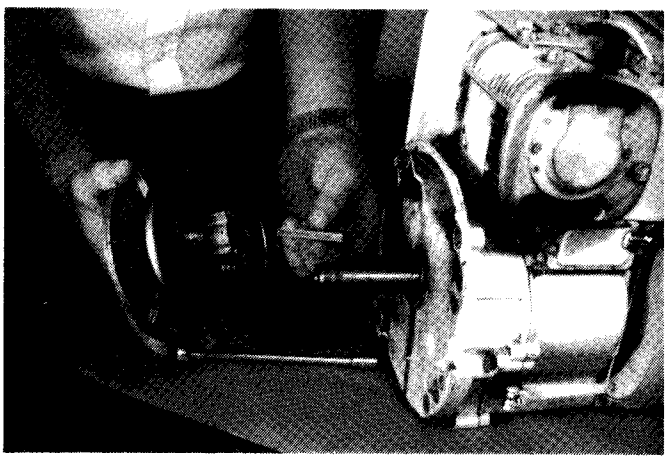


FIG. 4. 37 - REMOVE THREE SCREWS

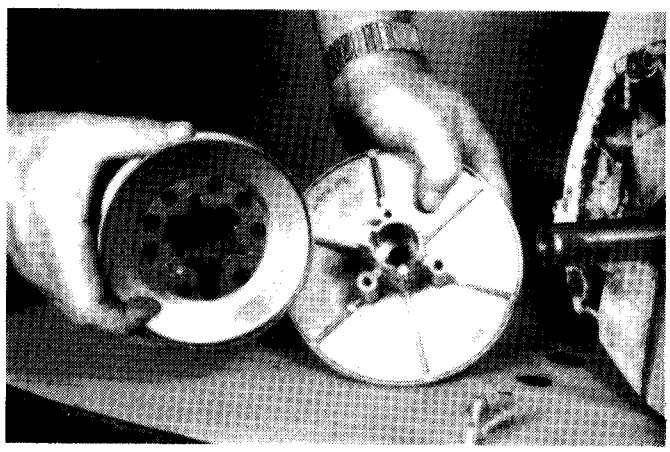
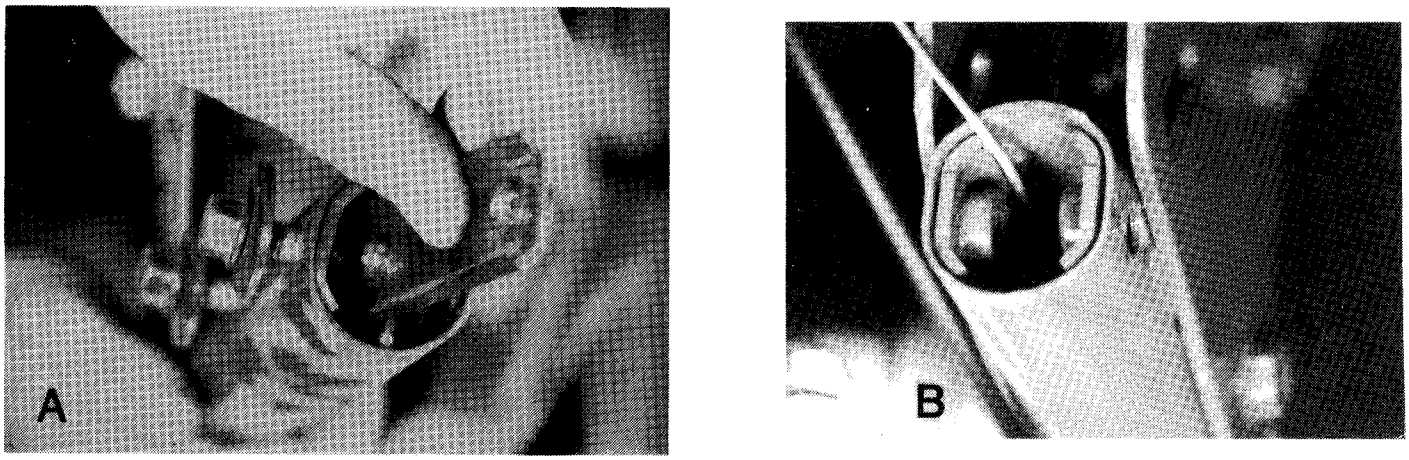


FIG. 4. 38 - SEPARATE PULLEY FROM DISC

Notes

SECTION 5: HANDLES & CONTROLS



FIGURES 5. 1 - REPLACEABLE BACK-UP PLATES

The handles of rear tine tillers can be subject to considerable abuse even under normal operating conditions. Because of this a number of improvements have been made involving the handles. The back up plates in early models included extruded holes which showed a tendency to strip (figure 5-1A). The plates now include weld nuts to prevent stripping of the self tapping bolts and or plates (figure 5-1B).

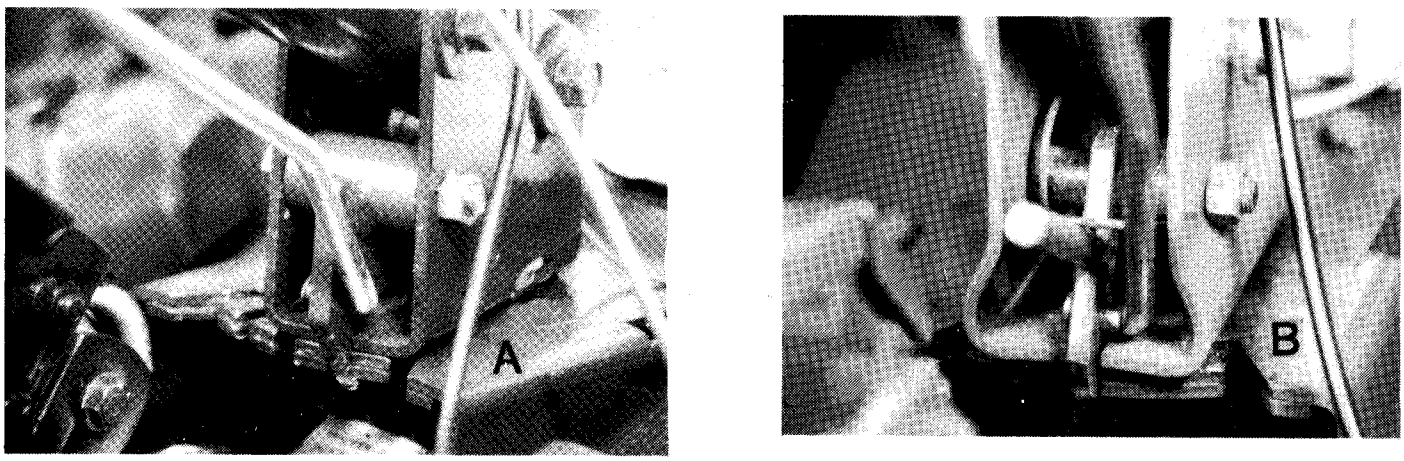


FIGURE 5. 2 - HANDLE & BRACKET CHANGES

Other areas of improvement involved the handle bracket and latch brackets. Early 8 HP models used the handle bracket handle release arrangement shown in figure 5-2A. Later models have a stronger brackets and modified release rod shown in figure 5-2B. The latch bracket (figure 5-3B) was made thicker and later models use a nut retainer, cotter pin and larger diameter washer for more positive retention than the early center lock-nut arrangement shown in figure 5-3A.

FIGURE 5. 3 - LATCH BRACKET CHANGES

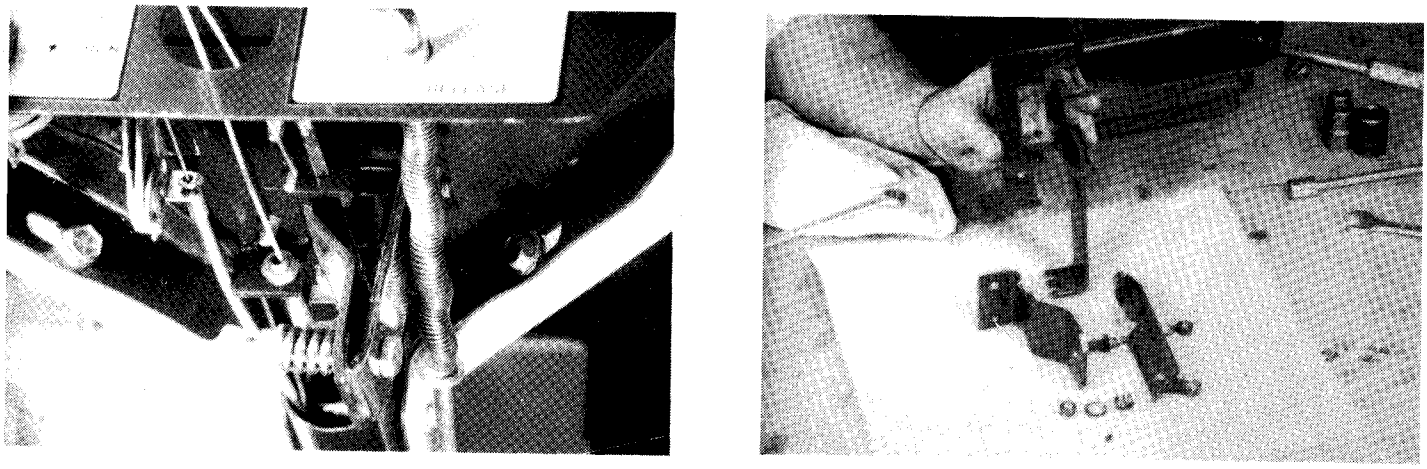


FIGURE 5. 4 - HANDLE BRACKET DETAILS

HANDLE DISASSEMBLY PROCEDURE

STEP 1: Disassemble handle assembly. Note: Leave stud in place on handle.

STEP 2: Place handle on table with stud and cap screw facing up.

STEP 3: Slide handle arm through handle bracket so that the notches face each other.

STEP 4: Place handle bracket and arm on stud.

STEP 5: Place handle brace over cap screw. Secure with (2) self-tapping screws. Place spring, flat washer, and nut on cap screw.

SECTION 6: SET-UP INSTRUCTIONS

RT5 TILLERS

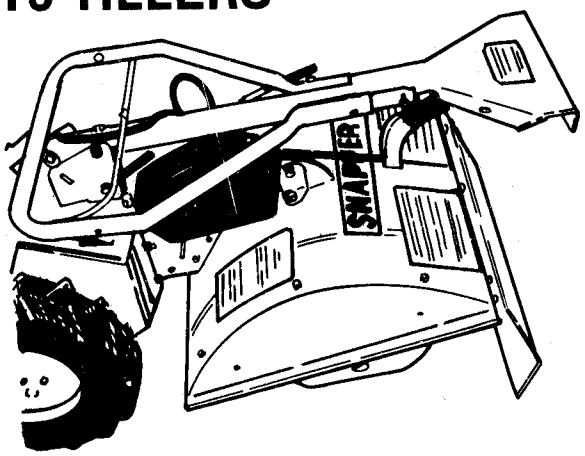


FIG. 1 - HANDLE FOLDED for SHIPMENT

The handle support tube has been lowered and the handle bar has been folded forward on the tiller for shipping purposes. The attaching hardware items are installed finger tight in appropriate location. Tools required are one 9/16 and two ½ open or box end wrenches or sockets. Set-up the unit as follows.

STEP 1: Remove the two bolts installed in lower holes of the support tube, raise the upper end of the tube, reinstall the two bolts thru the slotted holes in the pivot bracket and securely tighten these using the 9/16 wrench. Also tighten the top two bolts (figure 2).

STEP 2: Remove the locknut and the capscrew from the top hole in the support tube and the two self-tapping screws installed loosely on the inside of the handle bar, swing the handle upward and rearward into position, insert the capscrew thru the handle and tube, (figure 3) install the locknut and secure these using the two 1/2" wrenches. Also securely tighten the other capscrew and locknut. Install the two self-tapping screws in the slotted holes on the underside of the center panel (figure 4) and securely tighten these with a 1/2"wrench.

STEP 3: Pull one end of the clutch control bail (figure 5) out of the bushing in handle bar, slip the eyelets of the clutch cables over the end of the bail, slide the cable toward the center then reinsert the bail in the handle bar bushing. Snap the cover over the cables as shown in figure 5.

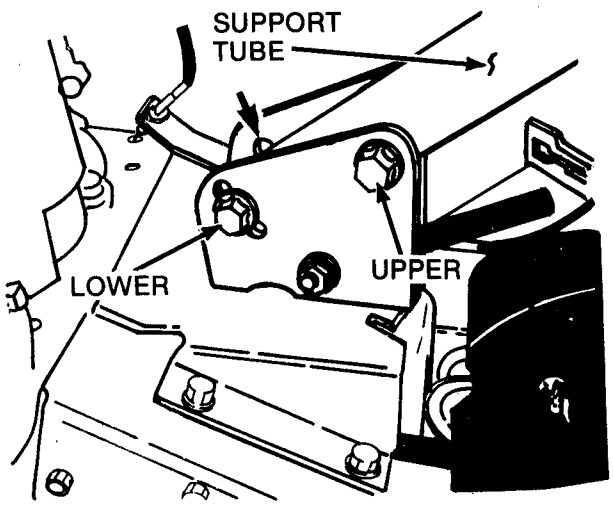


FIG. 2 - RAISE HANDLE TUBE

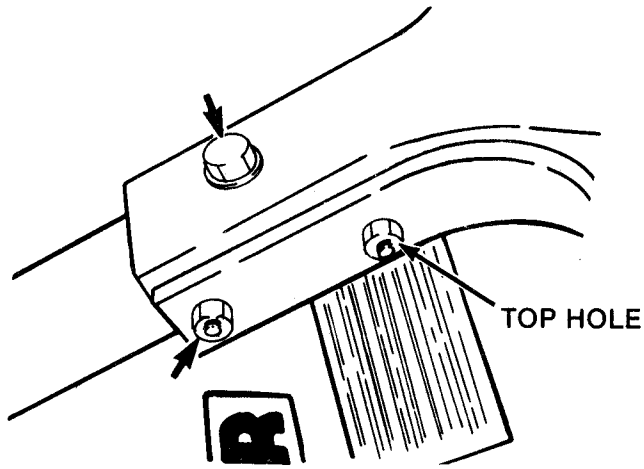


FIG. 3 - SECURE HANDLE TO PANEL

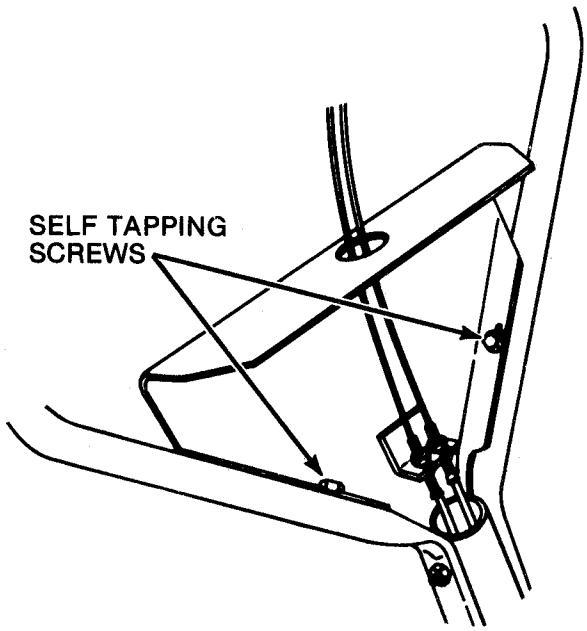


FIG. 4 - SECURE HANDLE (UNDERSIDE)

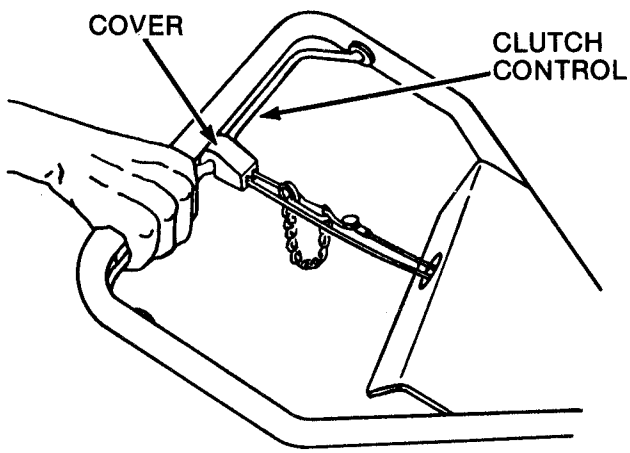


FIG. 5 - CLUTCH CONTROL CABLES

RT8 NEXT PAGE

SET-UP INSTRUCTIONS

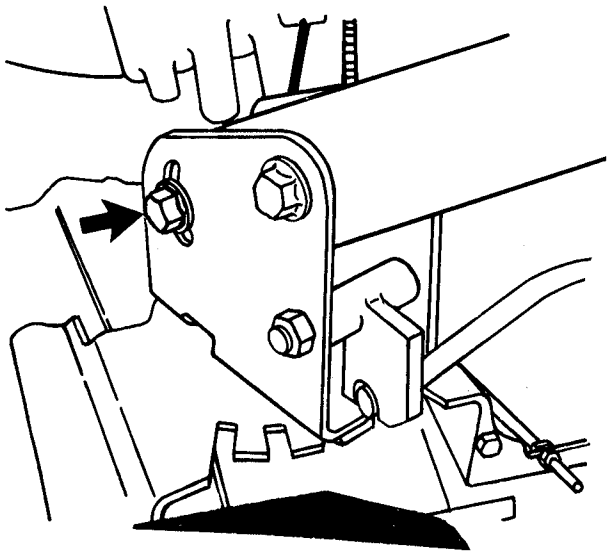


FIG. 1--SUPPORT TUBE TO PIVOT

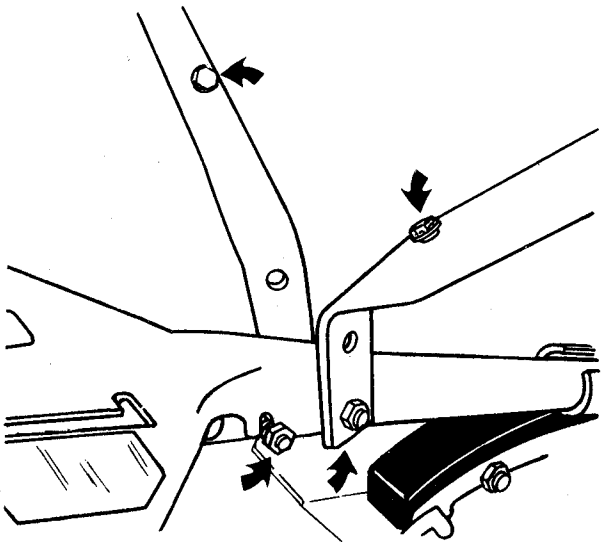


FIG. 2--HANDLE BAR ATTACHMENT

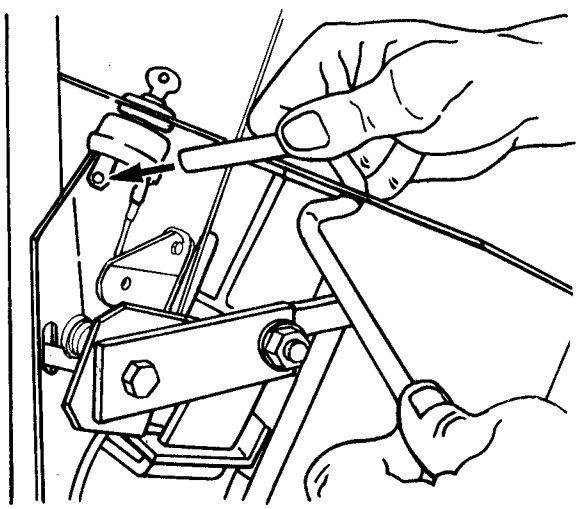


FIG. 3--RELEASE ROD THRU PANEL

RT8 TILLERS

The handle support tube is lowered, the handle bar is folded forward and the release rod is detached for shipping purposes. Hardware items are either installed finger-tight in appropriate location or are included in a parts bag. Tools required for set-up are two each, 9/16 and 1/2" wrenches.

STEP 1: Remove the bolts and washers from the lower holes of the support tube, loosen the two upper bolts, raise the upper end of the support tube then insert the bolts and washers in slotted holes of the pivot bracket and securely tighten all bolts (Figure 1).

STEP 2: Remove the bolt and nut from the upper hole of support tube, loosen the lower bolt, remove the two self-tapping screws from the inside of the handle bar, swing the handle bar back into position over the center panel. Secure the handle bar to the support tube with bolt removed earlier, tighten the lower bolt then secure the handle bar to the underside of the panel with the two self-tapping screws (Figure 2).

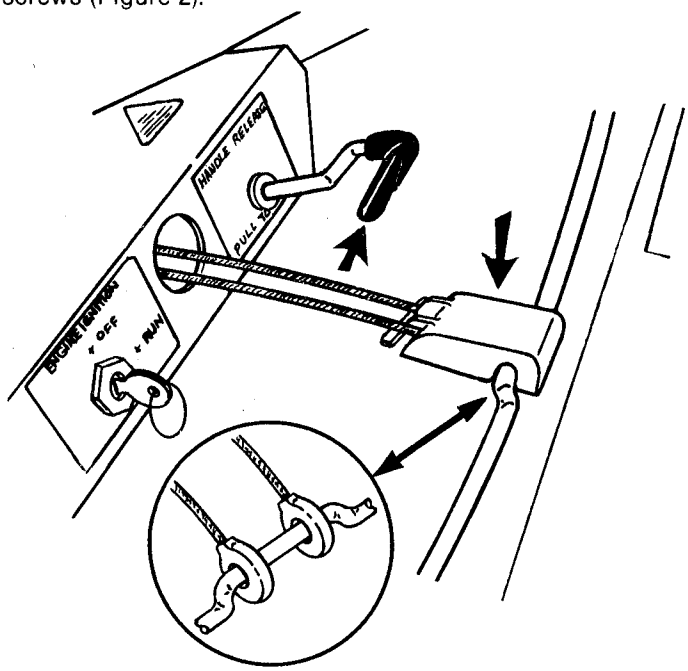


FIG. 4--CABLES & GRIP INSTALLATION

STEP 3: Install the flat washer, spring and nylon bushing (in hardware bag) on the handle release rod then insert the rod thru the underside of the center panel as shown in figure 3 and insert the lower end of the rod into the hole in the release mechanism as shown in figure 1. Secure the lower end of the rod with the E-clip provided in parts bag.

STEP 4: Pull one end of the clutch control bail out of the bushing in the handle bar, slip the eyelets of the clutch control cables over the end of the bail, slide the cables toward the center then reinstall the bail in the handle bar bushing and install clip over eyelets(Figure 4).

STEP 5: Slip the grip over the end of the handle release lever to complete the set-up procedure (Figure 4).

Notes

IT IS THE POLICY OF SNAPPER POWER EQUIPMENT TO IMPROVE ITS PRODUCTS WHENEVER IT IS POSSIBLE AND PRACTICAL TO DO SO. WE RESERVE THE RIGHT TO MAKE CHANGES OR ADD IMPROVEMENTS AT ANY TIME WITHOUT INCURRING ANY OBLIGATION TO MAKE SUCH CHANGES ON PRODUCTS MANUFACTURED PREVIOUSLY.

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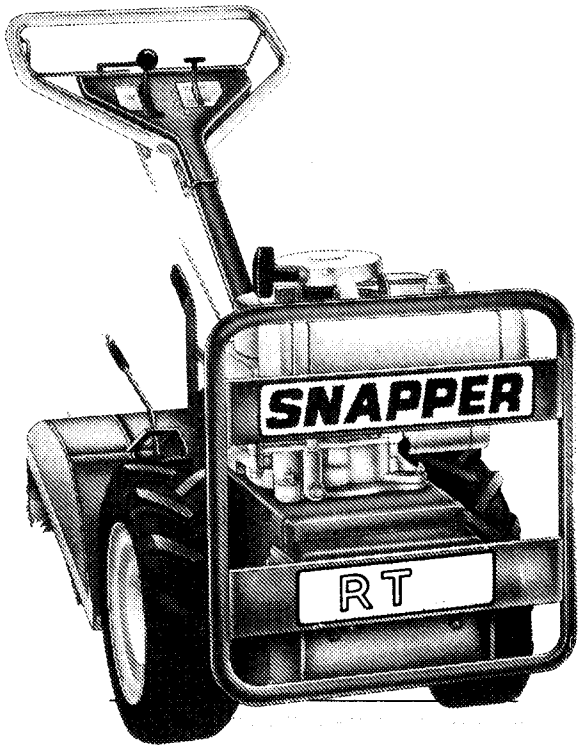

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(7/85 ISSUE)

MANUAL #07023